

# Railway Age

AND RAILWAY REVIEW



FIRST HALF OF 1928—No. 17

April 28, 1928

SEVENTY-THIRD YEAR

Quarry Products Distort Flat Plates  
Carry Them Safely with

AJAX CORRUGATED DOORS



**UNION METAL PRODUCTS COMPANY**

NEW YORK · CHICAGO · PHILADELPHIA · ST. LOUIS · WASHINGTON  
RICHMOND · HOUSTON · SAN FRANCISCO · KANSAS CITY · MONTREAL

# According To Specifications

A SIZE 5 tie at *International* measures 7 inches by 9 inches or better. A size 4 measures 7 inches by 8 inches or better; and so on for 3's, 2's and 1's.

*International* ties are properly graded.

*International* ties are perfectly sound.

Decay in the slightest degree does not exist in them.

*International* gives full value for your tie dollar.

*Contract Now  
for future delivery*



*This Dating Nail permanently  
identifies International Ties.*

**International Creosoting & Construction Co.**  
General Office: Galveston, Texas

Plants: Texarkana, Texas      Beaumont, Texas  
Galveston, Texas

# *International*

## **STANDARD SPECIFICATION TIES**





# Railway Age

Vol. 84 April 28, 1928 No. 17



On the Boston & Maine at West Medford, Mass.

## Contents

### Pennsylvania Works Derrick Cars In Double Harness ..... Page 954

An article telling of use of harnessed cars in erecting heavy, long girders in Wabash River bridge without use of falsework.

### Electric Locomotives for Brazil ..... 959

B. S. Cain, railway engineer, General Electric Company, tells of novel method of assembly used in the construction of passenger motive power for Paulista Railway.

### Atlantic Coast Line Simplifies Stocks of Materials ..... 969

L. F. Duvall, assistant general storekeeper, Atlantic Coast Line, Wilmington, N. C., tells of effecting 25 per cent reduction in varieties of materials studied through standardization.

#### EDITORIALS:

Pennsylvania Adopts Cab Signals .....	949
Lackawanna to Electrify .....	949
The Erie Improvement Plans .....	949
Study the Highway Crossing as a Pavement .....	949
Vacation Travel Advertising .....	950
"Seconds Count" .....	950
Controlling Yard Operations .....	950
Locomotives—New or Modernized .....	950
Pension Plan Failures .....	951
Less Competition and More Co-operation Needed .....	952
Romance in Railway Supply Business .....	953

#### GENERAL ARTICLES:

Pennsylvania Works Derrick Cars in Double Harness ....	954
Pullman Ships Cars to South Australia .....	957
D. L. & W. to Electrify Its Suburban Lines .....	958
Electric Locomotives for Brazil .....	959
Wabash Fuel Saving .....	961
Freight Car Loading .....	962

#### GENERAL ARTICLES—Continued

Pulverized Coal Burning Locomotive Built in Germany ..	963
Accounting Machine Proves Time Saver in Stores Work ..	966
Self-Opening Cotter Key and Pin .....	966
The Outlook for the Railways, by F. W. Green .....	967
Atlantic Coast Line Simplifies Stocks of Materials, by L. F. Duvall .....	969
Oil-Electric Locomotive Economical in Service .....	970
Further Hearings on Automatic Train Control .....	971
George B. Elliott Elected President of A. C. L. ....	976
Front End Blowers as Fuel Wasters, by J. E. Bjorkholm ..	977
National Railways of Mexico Improve Car Handling, by S. W. Fisher .....	978
Railways Object to Subsidizing Barge Line with Traffic ..	979

#### LOOKING BACKWARD ..... 980

#### COMMUNICATIONS AND BOOKS ..... 981

#### ODDS AND ENDS OF RAILROADING ..... 982

#### NEWS OF THE WEEK ..... 983

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York.

EDWARD A. SIMMONS, *President*  
L. B. SHERMAN, *Vice-Pres.*

HENRY LEE, *Vice-Pres. & Treas.*  
SAMUEL O. DUNN, *Vice-Pres.*  
F. H. THOMPSON, *Vice-Pres.*

C. R. MILLS, *Vice-Pres.*  
ROY V. WRIGHT, *Sec'y.*

CHICAGO: 105 West Adams St.  
WASHINGTON: 17th and H Sts., N. W.

CLEVELAND: 6007 Euclid Ave.  
SAN FRANCISCO: 74 New Montgomery St.

#### Editorial Staff

SAMUEL O. DUNN, *Editor*  
ROY V. WRIGHT, *Managing Editor*  
ELMER T. HOWSON, *Western Editor*  
H. F. LANE, *Washington Editor*

B. B. ADAMS  
C. B. PECK  
W. S. LACHER  
ALFRED G. OEHLE  
F. W. KRAEGER  
E. L. WOODWARD  
J. G. LYNE

J. H. DUNN  
D. A. STEEL  
R. C. AUGUR  
R. A. DOSTER  
JOHN C. EMERY  
MARION B. RICHARDSON  
L. R. GURLEY  
H. C. WILCOX

R. S. KENRICK  
NEAL D. HOWARD  
F. M. PATTERSON  
RICHARD W. BECKMAN  
LLOYD GEORGE  
CHARLES LAYNG  
GEORGE E. BOYD

*The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).*

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, \$6.00. Foreign countries, not including daily editions \$8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, \$1.00; foreign countries, \$2.00. Single copies, 25 cents each.

# UNIVERSAL

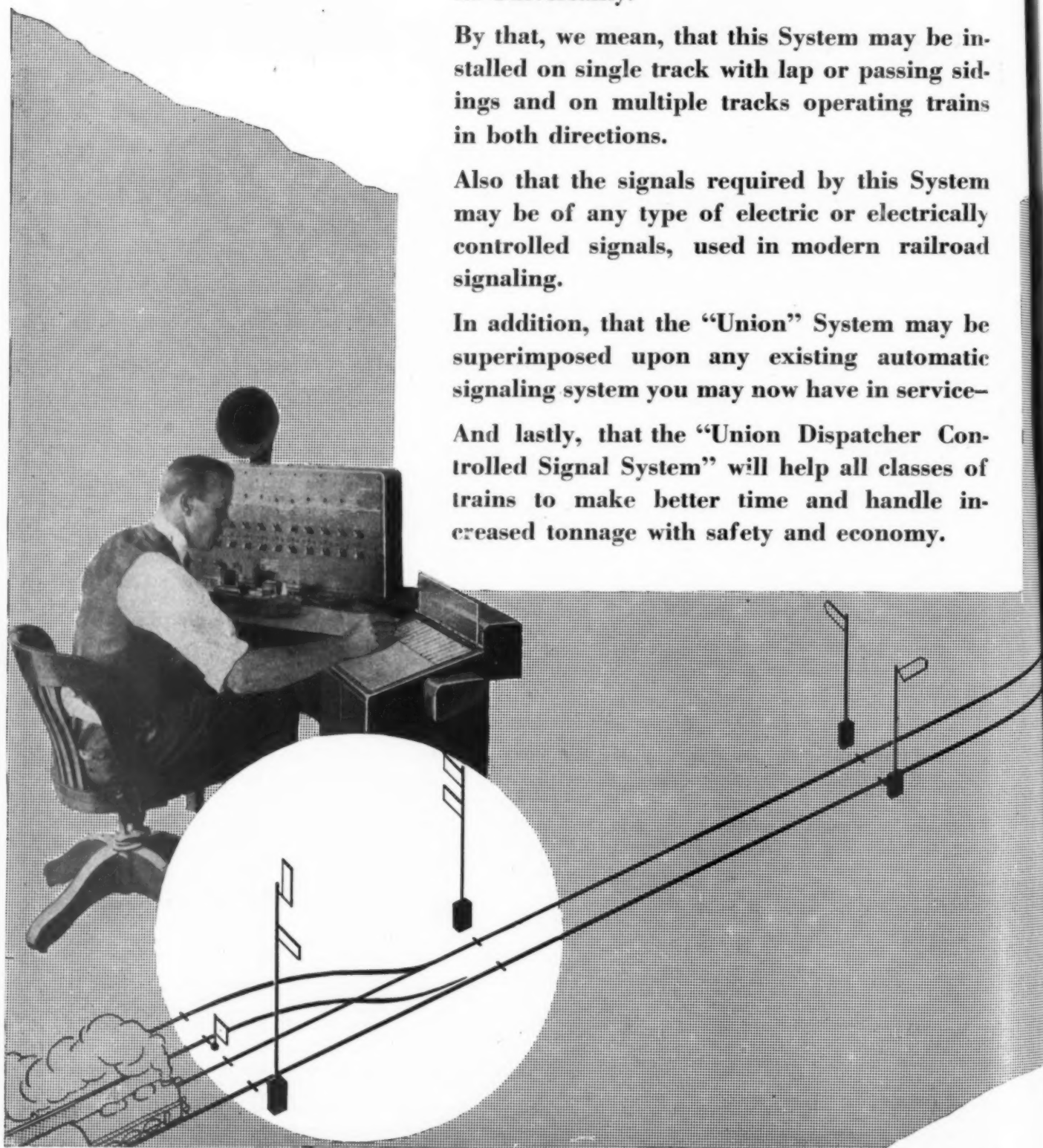
**A**N interesting characteristic of the "Union Dispatcher Controlled Signal System" is its Universality.

By that, we mean, that this System may be installed on single track with lap or passing sidings and on multiple tracks operating trains in both directions.

Also that the signals required by this System may be of any type of electric or electrically controlled signals, used in modern railroad signaling.

In addition, that the "Union" System may be superimposed upon any existing automatic signaling system you may now have in service—

And lastly, that the "Union Dispatcher Controlled Signal System" will help all classes of trains to make better time and handle increased tonnage with safety and economy.





# Railway Age

Vol. 84, No. 17

April 28, 1928

Table of Contents Appears on  
Page 5 of Advertising Section

## *Pennsylvania Adopts Cab Signals*

**T**HE Pennsylvania proposes at once to install cab signals, without automatic stops, on the main portion of its New York division, one of the busiest four-track railroads in the country, and has appropriated \$1,350,000 for the purpose. The arguments in favor of this method of expending money to promote the safety of trains, in preference to installing more costly and complicated automatic brake-setting apparatus (as the government has required on thousands of miles of track), which the chief signal engineer of the road has laid before the public on various occasions, thus become the basis of the settled policy of the company. The detailed reasons for this action were set forth by Mr. Rudd before the Commission at Washington this week, as shown in the report on another page. The road obviously, hopes for the approval of the Commission as fully satisfying the demands of the public in this feature of train operation, not only of its action on the New York division, but as a general policy.

## *Lackawanna to Electrify*

**T**HE Delaware, Lackawanna & Western has announced its plan to electrify its suburban lines in Northern New Jersey, 66.8 route miles, for the most part two-or three-tracked. Some decision on the question was expected, since several weeks ago organizations of patrons of the line presented petitions asking for the improvement and stating a willingness to consent to an increase in commutation rates to contribute toward the expense. At intervals for a number of years a decision by the Lackawanna to electrify has seemed imminent, but each time a definite conclusion has been delayed, possibly by such considerations as the high capital cost, the excellence of the existing steam service, or the question of what system to adopt. That the railroad anticipated the step is evidenced by the fact that of recent years its new cars have been designed to be easily adapted to electric operation. Regardless of these plans, however, it is doubtful if they would have been brought to early fruition had it not been for the action of civic bodies in the territory volunteering to submit to increased rates in return for improved service. This action is so unusual that we called attention to it editorially in our issue of April 7, page 788. The usual procedure in such cases is for public demand to be stirred up, but with no thought that anyone but the railroad should pay the bill. The success of the Lackawanna patrons in securing quick acceptance of their program should, perhaps, be suggestive to suburban groups elsewhere who also seek improved service but who have never tried the formula used here, i.e., of offering to pay something toward the improvement. Even if the transportation of suburban passengers were profitable for the railroads, which it seldom is, the fact

still remains that additional capital expenditures to improve the service redound only slightly to the benefit of the railroad. The real gainers from grade crossing elimination, station reconstruction and beautification and frequent, comfortable service are always the owners of real estate. Each improvement the railroad makes adds value to the property in the territory it serves. It is fitting, therefore, that some public contribution should be made for those railroad improvements which will benefit the public greatly and the railroad but slightly or not at all.

## *The Erie Improvement Plans*

**T**HE *Railway Age* so far in 1928 has published a number of announcements of improvement programs of different railroads which run into millions of dollars. There is considerable satisfaction to be found in these announcements by both those who look to them as evidence of continuous effort on the part of the railroads to keep their properties at a high standard of efficiency and those who look at such announcements from the point of view of the equipment, the supply and the construction industries, as well as from that of the economic welfare of the country in general. The latest of the railroads to join the 1928 list of those spending more than the usual amounts for improvements is the Erie. Details of this road's announcement will be found elsewhere in this issue. It plans to spend \$27,000,000 for locomotives, freight and passenger cars, for new construction, installations of signals, and improvements to track and roadway, thus carrying on its rehabilitation program begun last year.

## *Study the Highway Crossing as a Pavement*

**O**NE of the most actively discussed subjects before track maintenance officers today is the design, construction and maintenance of highway crossings. Like the problem of grade crossing protection, it has assumed increased importance with the growth of highway traffic and bears a close relation to the problem confronting the highway authorities in providing durable pavements for roads and streets. While it must be conceded that the requirements of the crossing construction are much more severe than those of the ordinary pavement, the primary function of the crossing is to serve as a roadway for highway vehicles, and any form of construction which would not be a success in the highway at points away from the crossing under the traffic imposed could not be expected to render satisfactory service in the track. The failure to appreciate this simple truth has been responsible for the poor results obtained with some forms of highway crossings.



Thus, a crossing constructed of crushed stone and screenings can be expected to serve the purpose only in a highway subjected to a traffic that is not too severe for a water-bound macadam or gravel-surfaced road. The requirements of an effective crossing are complex, for the wave motion of the track introduces stresses that are not imposed on the ordinary highway. But it is obvious that any construction which will not give a reasonable life on a highway with a given volume of traffic will not prove any more satisfactory in a crossing on the same highway. A more intensive study of highway construction should prove profitable to railway officers in solving this difficult problem.

### *Vacation Travel Advertising*

**T**HE appearance of numerous railway and steamship advertisements in the current periodicals is a reminder that the summer vacation travel season is not far off. On the surface, at least, it appears that the transportation companies are spending more this year than last in advertising their summer services. Particularly does this seem to be true of the trans-oceanic steamship lines. By offering comfortable accommodations at low rates, these lines are attracting steadily increasing numbers of summer travelers. Although the railways benefit to a certain extent from overseas travel, due to their carrying passengers to and from the seaports, it is obvious that they benefit from this to a less extent than they would if they received all of the vacationists' travel money. Getting people to travel at home instead of abroad, therefore, is an object which the railways should try to attain. Nor should the advantages of train travel over automobile travel at home fail to be brought home to prospective vacation tourists. The railways, as a result of the money they have spent to develop new vacation resort areas, and as a result of the establishment by a number of them of motor coach tours radiating into regions of scenic grandeur remote from their rail lines, have more new attractions to offer tourists this summer than they have ever had before. Advertising of these new features will help to attract people to them. It is not too soon to begin such advertising, since vacations are already being planned.

### *"Seconds Count"*

**T**HE importance of on-time movement of passenger trains, particularly under present conditions, can hardly be over-emphasized. It is only by excellent performance in this regard, supplemented by comfortable and even luxurious equipment that the declining traffic may be retained, and some of it regained. Relatively, it is not extremely difficult to operate passenger trains on time in fair weather, when the freight traffic is light. The real test comes during storms, zero weather and heavy seasonal freight traffic. Running passenger trains on time under such circumstances can only be accomplished by co-operation and meticulous attention to detail. To aid in the on-time operation of passenger trains, D. Coughlin, general manager of the first district of the Chicago, Rock Island & Pacific, has written a booklet appropriately entitled, "Seconds Count," which has been distributed to everyone on the railway concerned with the movement of passenger trains. This booklet gives detailed instructions as to the duties of operating, maintenance and mechanical department employees in aiding the on-time movement of passenger

trains. The list of such employees is comprehensive, including superintendents, trainmasters, chief engineers, trick dispatchers, station agents, operators, station baggage masters, train crews, yardmasters, master mechanics, road foremen of engines, engine-house foremen, car inspectors, locomotive and coach shop mechanics, roadmasters, signal supervisors, section foremen and tower-men. The duties of each of these are outlined in considerable detail, and stress is laid upon the fact that seconds count in the movement of passenger trains. A comprehensive and informative booklet such as this cannot but have a beneficial effect in keeping the employees on the alert to see that passenger trains maintain their schedule.

### *Controlling Yard Operations*

**I**N THE increasing operating efficiency of the past few years, improved yard operation has played a major part. Among the significant developments are the improvement in gravity switching, the spread of pre-classification and its elaboration into system main-tracking plants, and various mechanical features, such as car retarders, car oilers, flood-lighting and switch operating machines. In its major details, yard operation differs materially from road operation. The chief difficulty is to obtain the proper co-ordination between yards. In too many cases, yards are operated as independent units; in other cases, all the yards on one division or district may co-operate with each other, but not with yards on other districts. System-wide co-operation between yards is essential if maximum efficiency is to be attained. The operation of any yard or group of yards should not be left entirely in the hands of the yardmaster, the superintendent or the general superintendent. The railways with the largest mileage are rapidly coming to realize the importance of central control of yard operations. The most recent convert is the Missouri Pacific. On this line, an additional assistant general manager has been appointed whose duties consist of supervising all yard operations on the system. The supervision of yards should not be removed entirely from local operating officers for they should continue to exercise major control over the operations of yards in their territory. Rather, system supervision, with some form of central control, plus co-operation with local operating officers, is producing excellent results on the increasing number of railways where it is in effect.

### *Locomotives—New or Modernized*

**T**HERE are probably between 15,000 and 20,000 locomotives in this country, 20 years old or older, which have practically none of those features of locomotive equipment that are now regarded as the earmarks of modern motive power. A portion of these locomotives, because of their low capacity and the relatively small part of the time they are called upon to render service, do not justify the expenditure necessary to rebuild or re-equip them with modern economy-of-capacity-increasing devices. Such locomotives are those which already are, or soon will be, included in the program of retirements. Another portion of these loco-

motives, because they possess a unit capacity approaching certain traffic requirements, are probably legitimate prospects for a program of betterments. Although they will not achieve the full economy or capacity attainable in new locomotives completely modern in proportions and equipment, they may produce a sufficiently increased operating economy to make the investment in betterments an attractive one.

It is always difficult to know where to draw the line between these two opposing groups. Most of the facilities considered in betterment programs of this kind tend to increase the capacity of the locomotive without placing an additional burden on the boiler. The superheater, for instance, by reducing the steam consumption per unit of work done at the drawbar, permits an increase in drawbar horsepower output without proportionately increasing the fuel consumption or the amount of water which must be evaporated in the boiler. The feedwater heater, by returning waste heat to the boiler, also increases the possible drawbar horsepower output without increasing the amount of fuel which must be burned and the amount of heat which must be transferred through the evaporating heating surfaces of the boiler.

The effect of a program of boiler betterments, both as to economy and capacity, can be estimated with a reasonable degree of accuracy. There is another factor of importance, however, which is somewhat more indeterminate. This is the probable effect of an increase in drawbar horsepower output on the cost of machinery maintenance and on the general reliability of the locomotive as a whole. While no basis is available for accurately computing this effect in advance, a good rough basis for judgment is available in the character of the machinery maintenance history of the old power. What has been the experience with respect to engine failures? What parts have most frequently been responsible for failures? How frequently has it been necessary to drop driving wheels for box maintenance? Has the service of the main and side rods been of such a character as to indicate their ability to deliver increased power without an excessive increase in failures and enginehouse attention?

An analysis of the records for the answers to such questions as these will develop enlightening evidence which may lead to a different decision than that suggested by a study of the boiler output possibilities exclusively.

After such evidence has all been weighed and a conservative estimate of the probable return on the investment in the proposed betterments arrived at, this should be compared with the probable return from retirement of the old locomotives and investment in new and completely modern power. Notwithstanding the large increase in capacity for a given weight on drivers which is effected by power of completely modern design, the tendency in the design of machinery details is toward greater reliability and less maintenance. And in this connection, when a comparison of a program of modernization and of completely new power is made, it should not be overlooked that completely new locomotives always effect an additional saving in locomotive repairs for at least one, and sometimes for two full years before the final average of maintenance requirements is reached.

While this is a temporary saving, its amount is great enough to make it a factor worth considering—in some cases it may completely offset the maintenance charges incidental to the retirement of the old power.

## Pension Plan Failures

STUDENTS of industry, and particularly of personnel management in industry, who are looking far into the future, are showing much concern about old-age pension plans which are not squarely established on sound, scientific principles. The Special Committee on Industrial Pensions of the Merchants' Association of New York, in commenting on this, made the following statement: "The problem is not a mere accounting one; it is of a far more complex and scientific order. The somewhat unfortunate experience in the United States in regard to pensions has been due to the superficial character of the investigation which has preceded the establishment of most pension plans—the mere collection of the rules of a few previous plans framed after similar superficial consideration and selections from them arranged by persons unaware of the fundamental questions involved. Patent fallacies, once started in American pension plans, have thus endlessly perpetuated themselves."

Equally strong was a statement made by Luther Conant, Jr., in his book, "A Critical Analysis of Industrial Pension Systems." "It has been stated," said Mr. Conant, "that very few of the industrial pension plans in the United States today are so financed that they are likely to remain solvent without refinancing or modification." After making some comment on municipal and other public service plans, he states, "Indeed, it is hardly too much to say that the history of pension schemes has been a record of mistakes or failures. Even the elaborate Carnegie Foundation plan was forced to undergo a radical reorganization only a few years after it was started."

It has been estimated that 92 per cent of all railway employees are working for companies which pay pensions in some form, and that in all probability more than 60 per cent of all railway employees are working for railroads which maintain formal pension plans. While the exact amount of the pension payments by the railroads of this country in 1927 is not yet available, it was probably in excess of 25 million dollars. The steady growth of this figure in recent years and the fact that it will continue to mount for many years before it reaches a peak, challenges attention. For one thing, adequate reserves or funds have not been set up for such pensions; in other words, the accrued liability for past years and the current obligations are being almost entirely passed on to the future. This seems quite contrary to sound business principles and some of those who have given the problem critical study believe that grave dangers are involved in neglecting to fund these pension plans. If, on the other hand, proper provision can be made to cover the deferred liability and adequate contributions can be made to cover current liabilities, success promises to be assured, provided, and this again is an important question, that the right method is followed in determining the individual pension allowance. The methods now in general use, in most cases, are such that it is impossible to estimate closely future liabilities.

For these reasons it would seem that no effort should be spared on the part of those railroads which have formal old-age pension plans, to make the most complete and exhaustive studies to determine how adequately to finance the pensions and what methods can best be followed in determining the amount of the individual pension allowances. It will be necessary to secure the



co-operation of the Interstate Commerce Commission in devising ways and means of financing such plans if a fund is to be set up, and this simply emphasizes the necessity of a thorough survey and restudy of the entire question of old-age pensions.

## Less Competition and More Co-operation Needed

THE argument for the railways co-operating in formulating and trying to get carried out a general policy that would improve the railway situation as a whole is unanswerable because the prosperity or adversity of each railroad is so very largely determined by conditions and influences that affect them all in the same way. The measure of success attained by each railway, as compared with that of other railways similarly situated, depends of course, upon the efficiency of its management as compared with that of other railways. But practically all railway managements put excessive stress upon the results they can and do get by their own efforts as compared with the results that could be secured for their own individual properties through better co-operation between groups of railways and between the railways as a whole.

The desirability of more co-operation between the railways can be well illustrated by statistics showing the extent to which their total income and outgo were affected by changes similarly affecting all of them that occurred between 1923 and 1927. In 1923 they experienced the full effects of the important nation-wide changes in rates and wages made in 1922. They had fallen far short of earning a fair return in 1921 and 1922 and did not approach it in 1923, although it was a year of record-breaking freight business. Therefore, it seemed reasonable in 1923 to anticipate that general reductions in their rates and general advances in their wages would be postponed until they were earning a fair return. But this was not what occurred. Although in the six years ending with 1926 they did not earn anywhere near a fair return as an annual average, their net operating income sharply declined in 1927 and yielded a smaller percentage of return on both their property investment and their tentative valuation than in any year since 1922, excepting 1924, in spite of the fact that the freight business handled last year was the largest in history, excepting in 1926. Among the changes that occurred between 1923 and 1927 that led to this result in 1927, and the amounts they cost the railways, were the following: Decline in average revenue per ton per mile, \$150,400,000; increase in average hourly wage of employees, \$169,500,000; increase in taxes \$44,300,000; decline in passenger earnings, \$104,400,000; total \$468,600,000.

Perhaps the decline in passenger earnings should be excluded from these figures upon the theory that it was due to motor vehicle competition which railway regulating authorities could not control and railway managements could not effectively resist. It does not seem improbable, however, that, by co-operation, the railways might have reduced passenger train miles more than they have and by the resulting reduction of operating expenses partially offset loss of passenger earnings.

### *Rates Decline—Wages Increase*

After excluding revenues lost through the decline of passenger traffic, we have left to be considered changes

in average revenue per ton-mile, in average wage per employee-hour and in taxes, that produced in 1927 an aggregate effect of more than \$364,000,000. The net operating income earned by the Class I roads last year was \$1,085,000,000. If average revenue per ton per mile, average wage per employee-hour and taxes had been the same as in 1923 their total net operating income would have been about \$1,450,000,000. This would have yielded 6.3 per cent on their tentative valuation as of January 1, 1927; about 5.9 per cent on their property investment as of that date, and 5.75 per cent on about \$25,000,000,000, which probably was somewhat more than the property investment at the end of 1927. They actually earned 4.4 per cent on property investment. There was a great increase in the efficiency of operation of almost every railway in the country and a great improvement in the service rendered to the public; and the railways should have shared in the benefits of them; and yet, owing to general changes in rates, wages, taxes, etc., most railways failed to earn relatively as much net return in 1927 as in 1923.

It may be said that the decline of average revenue per ton per mile from 1.116 cents in 1923 to 1.081 in 1927 was not an accurate measure of the reduction in freight rates that occurred because changes in average revenue per ton mile are partly due to changes in the character of the traffic. This is true, but it strengthens rather than weakens the argument because coal and other low-grade traffic paying a low average rate constituted a smaller portion of total freight business in 1927 than in 1923 and, therefore, the general reduction in rates probably was larger than is indicated by the decline in average revenue per ton-mile. The downward readjustments of rates that have occurred have been partly due to regulation and partly to the action of the traffic officers of the railways. Obviously, only by co-operation can the railways effectively resist reductions in rates due to either of these causes or secure advances in them. Those who testify most strongly to the lack of the co-operation needed for these purposes are railway officers themselves, and especially traffic officers.

The increase in the average hourly wage per employee was from 61 cents in 1923 to 64.8 cents in 1927. The initiation of the cycle of advances in wages in which the railways are now involved can be traced without any difficulty to action taken by certain individual lines. These lines felt able to pay an advance to certain classes of employees and granted it in seeming disregard of the comparative inability of other railways to pay it, and even of the practical certainty that it would start a general advance in wages. It may be desirable for each railway to deal with its own employees. It is desirable that wages reasonable in proportion to those paid in other industries and to railway earnings should be paid by the railways. But surely it is obvious that there should be closer co-operation between the railways of each group and of the country as a whole in dealing with wage questions than there has been in the past. It seems rather illogical to talk as if different wages can be indefinitely maintained on different railways in view of years of experience indicating that, in the long run, approximately the same wages will be fixed on all railways by influences which hardly any railway is strong enough to resist.

Taxes may not seem to afford a field for effective co-operation by the railways; but it does appear probable that more concerted study and action by them regarding even taxes might bear some fruit.

The objective of each railway management is an an-



nual net return for its road sufficient to enable it to pay interest and reasonable dividends and provide good and adequate service to its patrons. Some railways are more favorably situated, more soundly financed, or more efficiently operated than others, and usually will earn better returns than the average. But the objective of each group of roads should be the development of traffic and the fixing of wages, rates and taxes which will enable the roads of the group as a whole to earn on the average a fair annual return. The comparative efficiency of the different railways in the group will to a considerable extent determine how the total net operating income earned by them will be divided between them; but if regulation and other influences and conditions to which they are all subject are such as to prevent the group as a whole from earning a fair total net operating income the result is almost sure to be that very few individual roads in the group will show satisfactory financial results. The more they compete with each other in readjusting rates and making changes in service that increase its cost with the object of increasing the net operating income of the individual roads that initiate reductions of rates or more expensive service, and the more they disregarded each other in fixing wages, the more they will probably reduce the total amount of net operating income to be divided between them, and the less net operating income each will earn.

#### *A Prosperous Industry the Correct Objective*

In spite of the prolonged decline in passenger business and the recent temporary decline in freight business the railways as a whole and those of each group always have had and still have enough traffic to enable them to earn a reasonable net operating income, while charging rates that would not be burdensome to the traffic and paying wages to the employees that would be reasonable as compared with those paid in other industries. When it is so easy to show, as is shown by the statistics we have given, that the entirely unsatisfactory net operating income earned by them in 1927 was due, not to lack of traffic, but to changes in rates, wages and taxes during the preceding four years which affected them all in the same general way it would seem that the necessity for less competition between them to gain small and usually temporary advantages for individual lines, and more co-operation between them to increase the total amount of net operating income to be divided between them would be plain to every railway officer.

What form or forms should co-operation take? As the objective should be a larger total net operating income, there should be co-operation in formulating, adopting and endeavoring to carry out a policy that will include the use of all legitimate means that apparently will be conducive to attaining the desired end. There should be co-operation in deciding what proposed regulatory legislation should be advocated and opposed. There should be co-operation in adopting a policy regarding valuation which can be definitely stated to the public and effectively defended in public discussion. There should be co-operation in regard to rate-making, both to secure more reasonable regulation of rates by the Interstate Commerce Commission and to secure more concerted and less competitive action by individual lines. There should be co-operation in the study of labor problems with the object of trying to prevent changes in wages by individual lines or by arbitration awards that will cause the wages the railways pay to tend constantly to become too high in proportion to the rates they are allowed to charge. There should be co-

operation by the various groups of railways in regard to service to keep the service rendered good while preventing either freight or passenger service from being made and kept needlessly expensive.

Rivalry between the railways in improving their properties and service and in increasing the efficiency and economy of their operation always will be desirable and no doubt always will prevail. But it certainly ought to be subordinated enough to co-operation between them to make possible the promotion of the welfare of the railroad industry as a whole, because in the long run both the public welfare and the financial results of individual lines will be determined in a very large measure by the prosperity of the entire industry.

## Romance in Railway Supply Business

THE history of the railroads is replete with the most interesting and often exciting incidents. The "iron horse" has always made a strong appeal to the average person and there has always been more or less of an air of romance about railroading. Alongside of this the railway supply business has appeared prosaic, unless, indeed, one has followed intimately the experiences of its inventive geniuses or production managers, with their trials and tribulations, and sometimes triumphs.

Moving pictures as they have gradually been perfected and used in an educational way in industry, have had a tendency to lift industrial operations to a much higher plane of interest. Men who could not find time, or were not in a position to visit manufacturing plants, have had the most important and significant aspects of important industrial operations brought to them through such pictures. It required a long time, however, to train experts and develop practices which would insure reasonably good results, because of a lack of color in a shop, the deliberateness of the detail operations, or the problems involved in space and arrangements, which made it difficult, if not impossible, to show clearly or in an interesting manner the important operations. With new and better lighted shops and the introduction of mass production methods, with the more orderly handling of material, it has been found possible to secure far better results. Indeed, the past few years have witnessed a remarkable improvement in the taking of such pictures, and they are now commonly used in technical conventions, railroad club meetings, and for all sorts of groups, large and small.

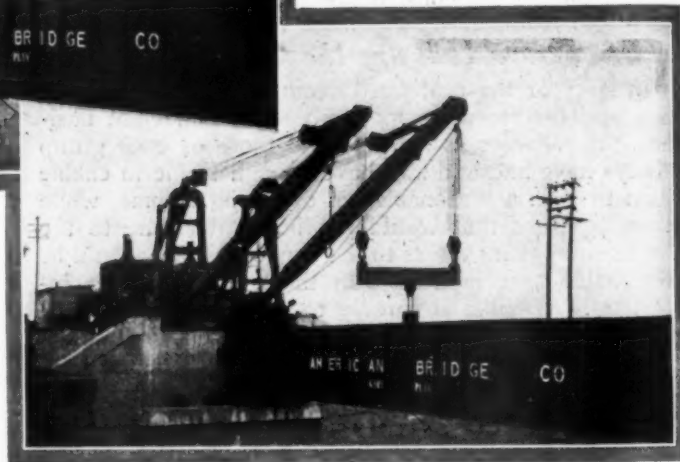
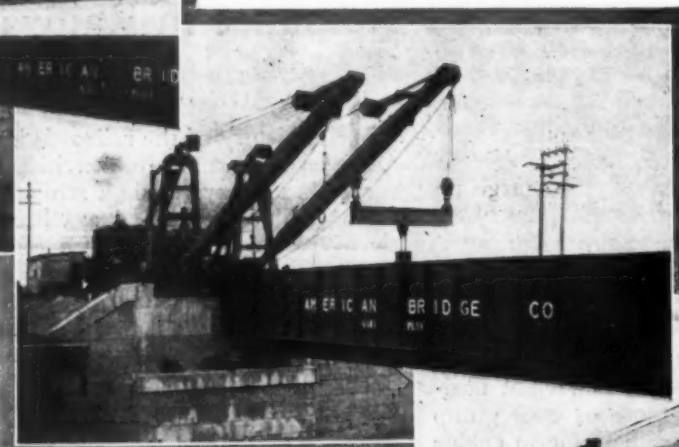
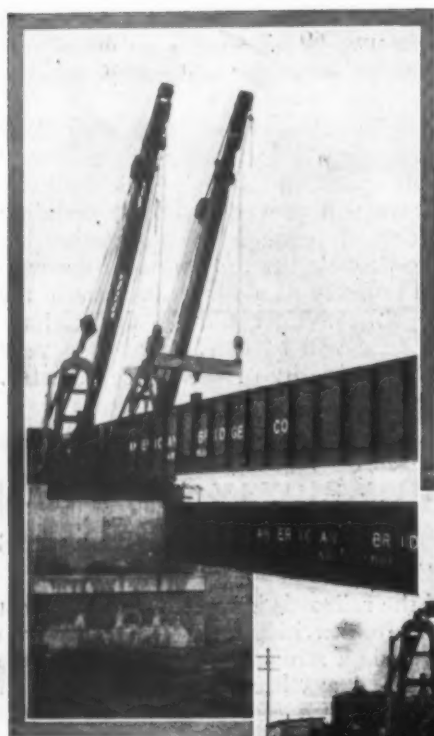
It has remained, however, for the New York Railroad Club at its last two meetings to take another step in advance by having an orchestra of several pieces accompany such pictures with specially arranged scores. Such music enhances the interest and, incidentally, need not be devoid of humor. This was demonstrated in the showing at the April meeting of the club, of the complete assembly of a locomotive by The Baldwin Locomotive Works, when the orchestra played the Mendelssohn Spring Song as the spring rigging was being applied; when the end-man rang a cow bell loudly as the pilot was being put into place; and finally when a tango was played as a locomotive for the president of Argentina was shown as it was hoisted on the ship for the long sea voyage.

There is no question but what many of the members of the club left the meeting with a very different conception of what they had previously considered a rather prosaic series of operations.

# Pennsylvania Works Derrick Cars in Double Harness

*Railroad erects long, heavy girders in  
Wabash River bridge without  
use of falsework*

*Three Successive Stages in the Erection of  
a Girder by the Use of Two Derrick Cars*



**T**HE erection of thirty-two 69-ton deck girders, 125 ft. long, by means of two derrick cars set side by side on adjoining double tracks and working progressively from one end of the bridge to the other, was the unusual expedient devised by the Pennsylvania in the construction of a double-track bridge over the Wabash river near Terre Haute, Ind. This bridge was built in connection with the construction of 1.8 miles of second track west from Terre Haute, as a part of the general program of double-tracking of the line between Indianapolis, Ind. and St. Louis, Mo.

The new bridge consists of eight spans of deck girders for each track, supported on concrete piers spaced 125 ft. 6 in. center to center and two abutments. The east abutment is of the "U" type, supported on concrete piles, while the west abutment, which is virtually an eighth pier, has wing walls built as independent units after the shaft had been completed. By introducing a short change of alignment, as shown on the general plan, the new bridge is located a short distance upstream from the old one, which was a single-track structure of five spans of through trusses erected in 1888 and supported on stone masonry piers built in 1873. This made it possible to construct both the substructure and superstructure of the new bridge without any interference with the operation of trains over the old river crossing. To avoid a reduction in the headroom of the waterway incident to a change from a through bridge to a deck structure, the track level over the new bridge was made 7½ ft. higher than on the old one, a change which could readily be provided for in the approaches.

The footings for the west abutment and the seven piers were carried down to depths ranging from 30 ft. to 52 ft. below low water level, through foundation material consisting primarily of gravel with some shale and a thin stratum of coal. The pier footings were

constructed as caissons 39 ft. long by 18 ft. 10 in. wide with a working chamber at the bottom and two dredging shafts 7 ft. in diameter, to facilitate sinking by both open dredging and the pneumatic process. For piers 1 to 5 inclusive, numbering from the east end, steel caissons

were assembled on land, set into water by means of a pontoon derrick, floated into place and sunk. For piers 6, 7, and 8, which were located where the ground was normally above water level, the caissons were built entirely of concrete except for the cutting edges, and the shape of the working chamber was formed in the excavation. Cofferdams above the caissons of all the piers were constructed of timber. The open dredging was done with an orange-peel bucket operated from a turntable derrick mounted on a pontoon composed of four steel barges 10 ft. wide by 40 ft. long, over which the weight of the derrick was distributed by means of two loading girders. Buried drift and debris, encountered in sinking the caisson for pier 2, caused considerable difficulty and made it necessary to shift the caisson to one side and then to the other to free some of the larger masses, logs, etc.

The change to pneumatic work was made by applying the air locks as extensions to the dredging wells. This was accomplished by bolting the flanges at the lower ends of the steel tubes to the concrete by means of bolts set in the rims of the wells, these flanges being set in cement grout to secure an airtight connection. The caisson work was carried out in eight hour shifts with

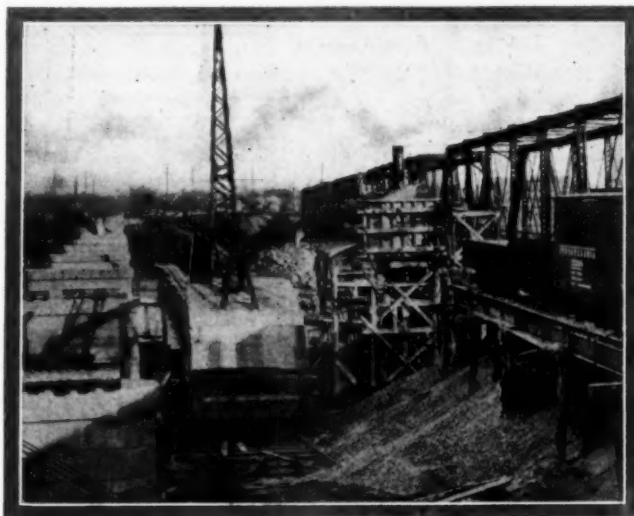


6 men and a foreman per shift in each working chamber, and the excavation averaged 100 buckets of spoil per shift. The maximum air pressure required was 27 lb. per sq. in.

The concrete materials were delivered on an unloading trestle built alongside the old bridge at its west end. This trestle was provided with a steel stringer deck to facilitate the dumping of the aggregates. The mixer plant was erected at the outer end of this trestle and consisted of a wooden frame supporting an overhead storage bin with two compartments, one of 20 cu. ft. capacity for sand, and another of 27 cu. ft. capacity for pebbles. The cement was chuted from a car spotted at the end of the trestle to a cement house, from which it was hoisted to the charging floor by means of an elevator. The mixer, which was of one cubic yard capacity, was located at such a height above the ground that it could be dumped by gravity into bottom-dump buckets mounted on narrow-gage cars which were operated on a delivery track that was extended across the river on a temporary trestle alongside the locations of the new piers.

Another important item in the concrete plant was a Loraine turntable crane with a 75-ft. boom and equipped with a clamshell bucket. This was used to charge the material bins of the concrete plant from the piles of aggregate under the unloading trestle, as well as to do the excavating for the construction of piers 7 and 8. Dur-

comprised 32 deck-plate girders. 125 ft. long and 10 ft. 6 in. deep, weighing 69 tons each. The method used was evolved in the absence of an adjacent track from which these girders could be erected by derrick cars from a hitch at each end or to avoid the construction of a temporary trestle for the same purpose and



The Concrete Plant, New Piers on the Left, Old Bridge on the Right

also because of the lack of any single piece of erecting equipment having sufficient lifting capacity at the necessary forward reach to handle one of the girders alone.

The solution adopted was made possible by the fact that the bridge was built for double track and comprised the use of two derrick cars with booms 71 ft. and 76 ft. long respectively and arranged to hoist the girders from a single hitch at mid-span by means of an equalizer beam, designed and built especially for the purpose. But even this plan entailed provision for an extension counter-weight at the rear end of each derrick car in the form of a freight car truck carrying a heavy wooden box, containing 26 tons of pig iron, this box being so arranged as to transmit the entire weight to a tail girder projecting from the end of the derrick car. Moreover,



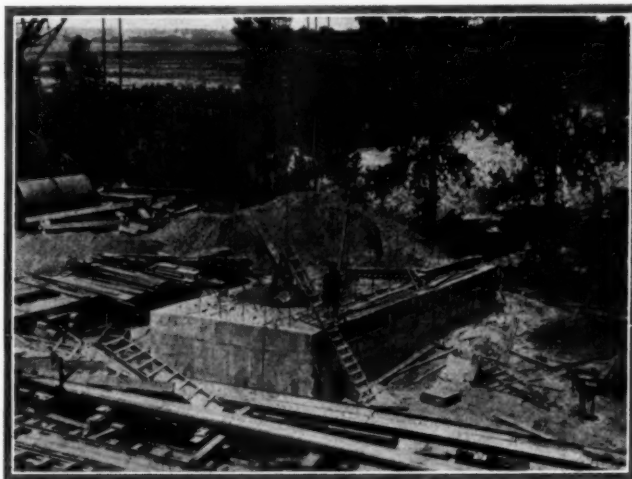
General View of the Substructure Work, Marine Derrick in the Foreground

ing the concreting of piers 6, 7 and 8 it was used for hoisting the concrete buckets for the delivery of the concrete to the forms, the same service, in the case of the river piers, being performed by the derrick mounted on the pontoon.

The concrete mixer and two air compressors, delivering 300 cu. ft. of free air per minute, were operated by electric motors, but a 72-hp. vertical boiler was provided for pumping water and syphoning the caissons as well as to provide steam for heating concrete materials during cold weather.

The substructure work required 7,490 cu. yd. of excavation, 7,532 cu. yd. of concrete in pier foundations, 2,853 cu. yd. of concrete in pier shafts, and 1,359 cu. yd. of reinforced concrete in the east abutment and in the wing walls of the west abutment. The concrete was proportioned according to the water-cement ratio for a strength of 2,000 lb. per sq. in. at 28 days and required approximately  $5\frac{1}{2}$  sacks of cement per cu. yd. Test cylinders were made each day for compression tests made at the laboratory of the Indiana Cement Company.

The outstanding feature of the project was the method adopted for erecting the superstructure, which



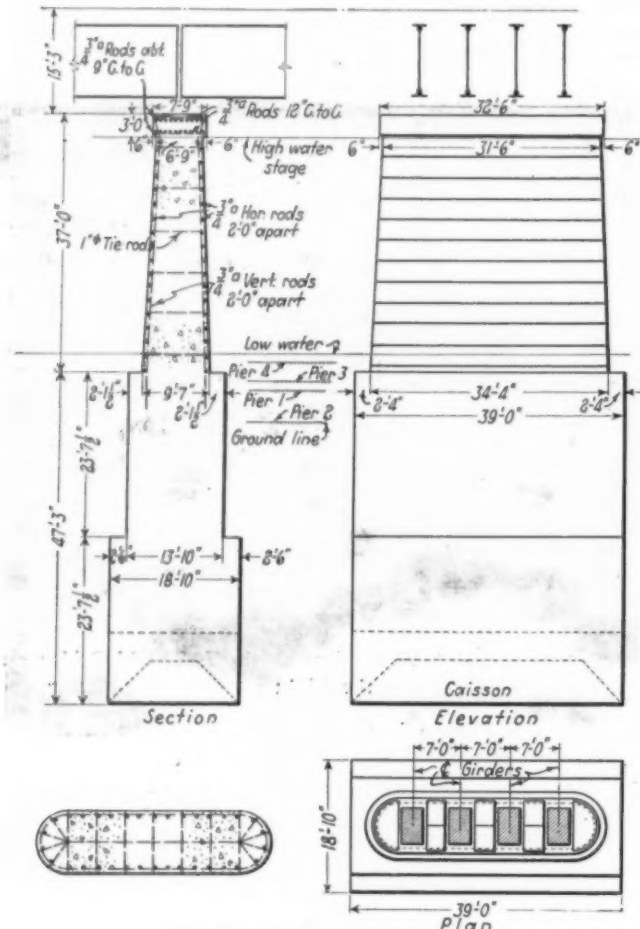
Sinking One of the Shore Piers by Open Dredging

this arrangement afforded the necessary stability only with the booms maintained practically on the center line of track and as will be explained later, special means were necessary to shift the girders out to their



final positions at each side of the longitudinal center line of the bridge.

As it was deemed unsafe to depend on ordinary



Details of Piers 1, 2, 3 and 4

girder hooks, a special rig was developed with which to attach the girders to the equalizer beam. This consists of a steel frame or sheave box bolted to the top

center point. The procedure in erecting each girder was as follows:

1. One of the outside girders, mounted on cars, was moved out to the end of one of the tracks, with one of the derrick cars following in the rear with a hitch at the rear end of the girder.

2. The second derrick car came forward on the other track and took a hitch on the forward end of the girder.

3. The girder was lifted off the cars and set in the space between the tracks, the tracks having been spread from the normal spacing of 14 ft. to 14 ft. 9 in. to provide the necessary clearance.

4. The cars were released and the derrick cars came up on the two tracks, took a hitch on the girder at the midpoint with the aid of the equalizer beam, and with the booms raised to full height, lifted the girder clear and moved out to the end of the tracks. Then by hauling in on the fall lines and lowering the booms, the girder was moved forward until it reached across the span, after which it was lowered on blocking that had been placed on the two bridge seats. The hoisting rig was then released from the girder.

5. One of the derrick cars then lifted the girder at its rear end and swung it out over the outside bearing shoe.

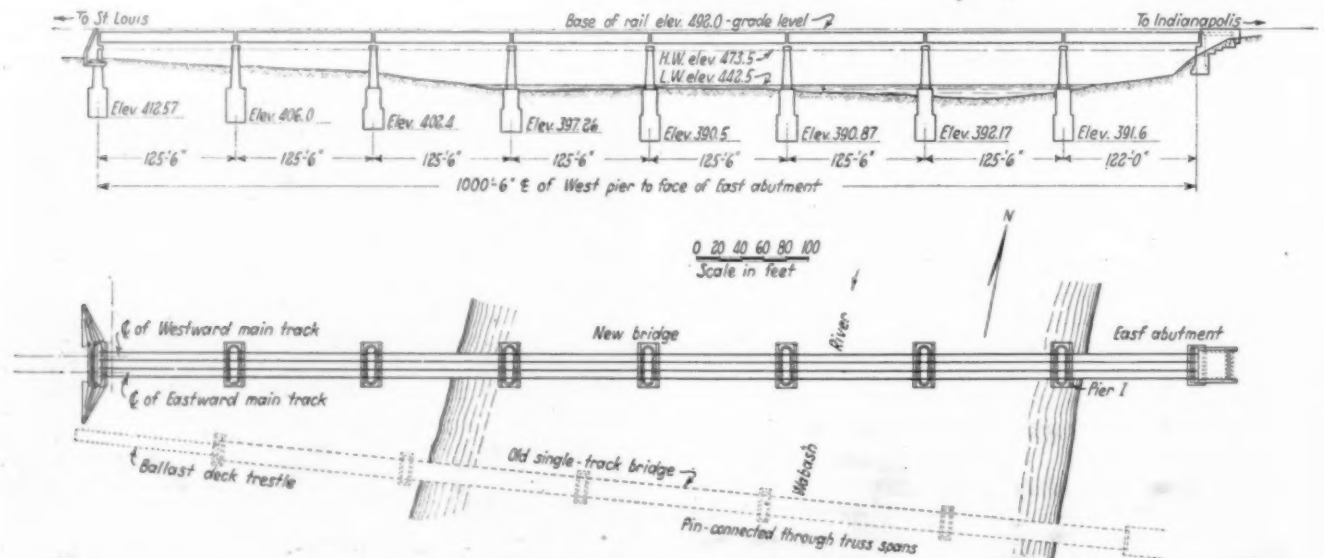
6. A jack was then used to slide the outer end of the girder over on the blocking until the girder was in its final position.

7. The above operation was repeated for the inside girder of the same pair.

8. One of the derrick cars were used to set the lateral and cross bracing, the track being laid on the span during this operation as the work proceeded.

9. The outer end of the span was jacked up to permit the placing of the bearing shoes, thereby completing the operation of erecting the span.

This operation was carried out without difficulty except during the erection of the first span. In this stage of the work, the derrick cars were necessarily spotted on the embankment back of the abutment and settlement of the track under the heavy load introduced diffi-



General Plan and Elevation of the New Bridge

flange in a position crosswise of the girder by means of eight one inch Maori steel bolts, the sheave provided in this box being engaged by a Robeling flexible bale which was attached to pins passing through plates projecting from the lower side of the equalizer beam at its

culties which were not readily overcome. Of course, no trouble of this sort was encountered in the erecting of the succeeding spans, during which the derrick cars were standing on the spans previously erected.

The construction of the Wabash River bridge as

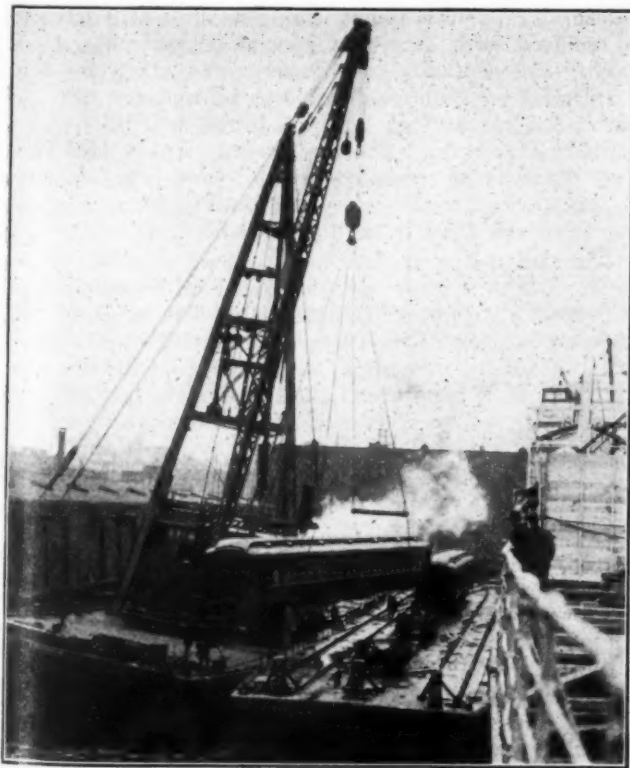
previously stated, comprised an important item in 62 miles of second-track work, completed between Indianapolis and East St. Louis during the last two years, as a result of which the total mileage of second track on this line has been increased from 61.4 miles to 123.4 miles in a total distance of 237.8 miles. All of the second track work has been accompanied, where necessary, with changes of grade, to reduce the ruling grades in both directions from 0.9 per cent to 0.5 per cent. In addition the work done last year embraced a change of line of 8 miles between St. Jacob, Ill., and Collinsville.

In addition to the Wabash River bridge, the stretch of second track constructed west of Terre Haute involved the construction of a double track reinforced concrete pile trestle of 24 spans of 16-ft. 6-in. slabs.

The substructure work on the Wabash River bridge was done by the Dravo Construction Company, Pittsburgh, Pa.; the superstructure was fabricated by the American Bridge Company and erected by the Seaboard Construction Company of Philadelphia, Pa. The work was done under the supervision of the engineering department of the Pennsylvania, Western region, of which I. W. Geer is chief engineer. E. E. Stetson, assistant to the chief engineer, had general supervision of the work, while F. J. Hoberg served as engineer of construction at Terre Haute.

## Pullman Ships Cars To South Australia

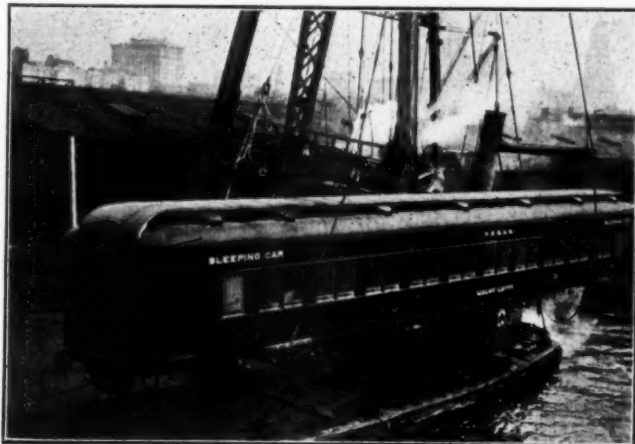
THREE cars, built for the South Australian Government Railway, by the Pullman Car & Manufacturing Corporation, are now on their way to Adelaide, Australia, where they will be placed on special gage trucks and the water and heating systems



Transferring Pullman Cars From the Car Float to the S.S. Port Nicholson for Shipment to Australia

and other Pullman features demonstrated under the direction of E. L. Goodwin, assistant mechanical superintendent, Chicago.

These are the first modern Pullmans built for Australian service. Two sleeping cars contain 10 compartments each, the third car being a diner with 12 tables, each accommodating four persons. All exteriors are in Pennsylvania red. As the following table indicates, these cars are neither as high nor as wide as standard Pullmans. They will be mounted on trucks with a gage of 5 ft. 3 in. as against the American standard of 4 ft. 8 1/2 in. Because of this difference it was necessary to send the cars to New York on stand-

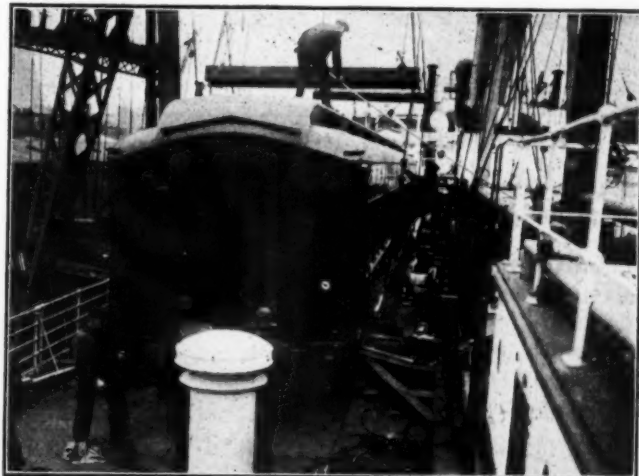


Close-up View Showing Steel Cable Slings Used in Lifting the Car Body

ard Pullman trucks, the Australian special gage trucks being loaded on flat cars. A comparison of the car measurements is shown in the table.

	Standard Pullman	Australian Special
Length over coupling face	82 ft. 11-1/4 in.	81 ft. 5 1/4 in.
Length between truck centers	58 ft. 6 in.	55 ft. 8 in.
Width over all at eave mouldings	10 ft. 1 in.	9 ft. 10-1/2 in.
Height, track to top of roof center	14 ft. 11/16 in.	13 ft. 8 3/16 in.

Two cars, the Mount Lofty (compartment) and Adelaide (diner) left New York on the S. S. Port Nicholson



Getting Ready to Anchor One of the Cars to the Ship's Deck

son on March 14 and the third, Macedon (compartment sleeper) on April 4. The route was via the Panama Canal.

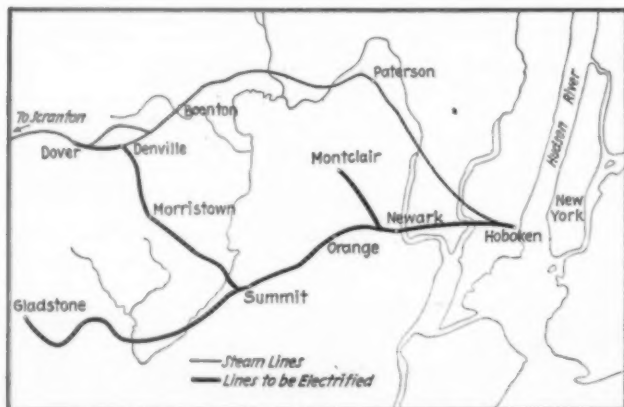
In loading, the cars were run on a car float and moored alongside the ship. A large derrick barge,



equipped with suitable steel cable slings, then was used to raise one of the cars at a time. The car float was moved out of the way after each lifting operation to permit the barge to be drawn close alongside of the ship, and the cars swung to the deck as shown in the illustrations. On the deck each car was supported on substantial cross timbers fitted with steel truck center plates so spaced as to fit exactly the center plates of the truckless car bodies. The cars were then securely anchored with heavy steel rods extending through each car and center plate into the timber base. Steel cables were also used as reinforcement against car movement under the action of the ship in heavy seas. Enclosures were erected over the cars to prevent any damage from salt air or spray.

## D. L. & W. to Electrify Its Suburban Lines

**E**LECTRIFICATION of 66.8 miles of its New Jersey suburban lines at a cost of from \$14,000,000 to \$18,000,000 has been announced by the Delaware, Lackawanna & Western. President J. M. Davis, in making the announcement for the road, said that the board of managers had authorized the electrification of the line from Hoboken to Dover, N. J., via Morristown, a distance of 40.5 miles; the Passaic & Delaware branch to Gladstone, N. J., a distance of 22.2 miles, and the Montclair branch, a distance of 4.1 miles, a total of 66.8 miles. The lines which it is



Map Showing D. L. & W. Lines to be Electrified

proposed to electrify are shown on the map. News of the planned electrification follows the recent presentation to the railroad of a petition by representatives of suburban communities on the line of the Lackawanna, having a population of around 1,250,000 asking that the road electrify its suburban lines and expressing a willingness to pay increased commutation fares to help defray the cost of the improvement.

President Davis' announcement follows in part:

"This matter of the electrification of the suburban lines of the Lackawanna has been the subject of much speculation and discussion on the part of our patrons and communities for a long time; it also has been accorded consideration by our board, but the cost of the present service which is thoroughly dependable and operates with clock-like precision, mounted so high that, considering the gradual loss of traffic to other forms of transportation that come and go, the increased cost of performing service and the everlasting pressure to reduce the rate on this or that between here and there,

placed us in a position where we were unable to imagine an increase in traffic or a reduction in expenses of sufficient proportions to enable the railroad to get its money back. Obviously, therefore, we have been rather cautious about incurring such a burdensome obligation.

"Now, however, along comes a committee composed of the following individuals representing all of the communities at interest urging the prompt undertaking of the electrification of the lines mentioned; William J. Orchard, president, and A. G. Kingman, secretary, Maplewood Civic Association; E. W. Wollmuth, executive secretary, and C. W. Fagg, traffic manager, Newark Chamber of Commerce; Frank L. Scheffey, Borough Council, Glen Ridge; W. R. Whittingham, Board of Trade, Millburn; Barton P. Turnbull, Summit Civic Association; James E. Shea, Business Men's Association, Chatham; H. W. Headley and N. O. Howlett, Township of Bernards, Basking Ridge; James W. McGuirk, Borough Council, Bernardsville; William G. Hurtig, Chamber of Commerce, and Mrs. D. F. Barkman, Woman's Civic Association, Morristown; L. M. Smith, Board of Aldermen, Dover; R. F. Newcomb, Chamber of Commerce, New Providence; L. H. Burch, County Council, and L. N. Grove, Morris Plains Association, Morris Plains.

"This committee expressed the opinion that the importance of this project was so outstanding to their communities that those whom they represented would be willing to pay increased commutation fares in order to secure the advantages of such improvement in transportation facilities, and placed itself on record agreeing to co-operate with the railroad in securing an increase in commutation fares. Under such circumstances, our board has authorized the going ahead with the project.

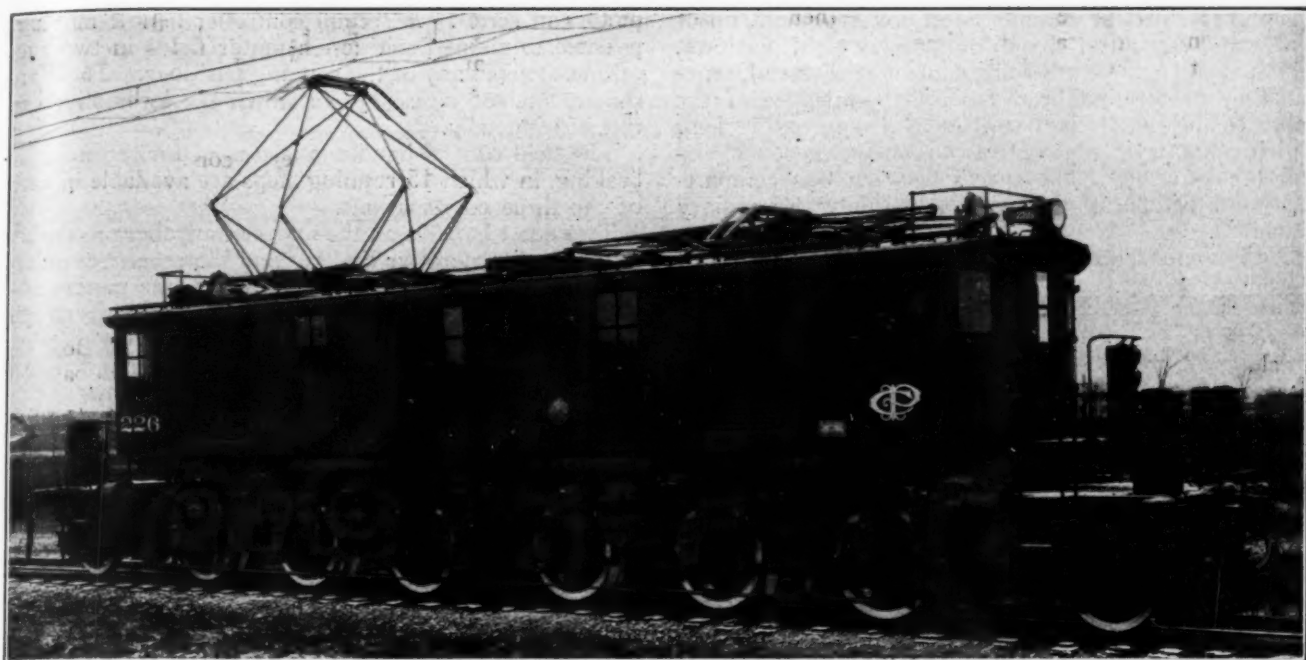
"Some conception of the far-reaching significance of the change and what is involved can be gained when one contemplates that while the construction of many of the present suburban cars is such that they can be altered to fit the new operating conditions, about one hundred of these cars which are now in good condition and serviceable for a long time to come, will have to be replaced with others of special design; that about seventy-five perfectly good locomotives which are now in splendid condition will have to be replaced, are not readily salable and, in all probability, will be reduced to mere scrap value; also that engine houses, coal-handling plants, water stations, ash pits and other railroad paraphernalia almost without end and incident to steam operation will have to be dismantled."

The railroad owns both land and water rights along the Hackensack river and has coal readily available to its lines. Officers of the company are weighing the advantages and relative cost of purchasing electric power from outside companies as compared with the construction of a generating plant and manufacturing its own power. The construction and equipment of the proper power plant and accessories will cost about \$4,250,000 and would raise the total cost of this electrification work to approximately \$18,000,000.

The work of construction will be handled by an electrical committee of the Lackawanna, appointed by President Davis, consisting of the chairman, E. M. Rine, vice-president and general manager; G. L. Ray, chief engineer; H. M. Warren, electrical engineer; E. B. Moffatt, general superintendent; C. J. Scudder, superintendent of motive power and equipment; and R. M. White, superintendent, with the advice and assistance of well-known consulting engineers.

Construction work will be started just as soon as the Lackawanna engineers can complete plans and, it is estimated, will be completed within two years.





Express Passenger Locomotive for the Paulista Railway.

# Electric Locomotives for Brazil

*Novel method of assembly used in the construction of passenger motive power for the Paulista Railway*

By B. S. Cain

Railway Engineering Department, General Electric Company.

THREE 147-ton electric passenger locomotives have been delivered to the Paulista Railway of Brazil by the General Electric Company, and two more are under construction in its shops at Erie, Pa. These locomotives, which are the largest of the 3,000-volt direct current type used outside the United States were required by the recently completed 94-mile extension of the Paulista from Rio Claro, Brazil, to Rincao. The railroad now has a total of 177 miles of line electrified.

Each locomotive is of the geared motor type and has two driving trucks articulated together and a cab mounted on center plates. Each driving truck has three

series across the line. The speed of the locomotive is controlled by series-parallel connections of the motors by accelerating rheostats and by reductions in motor field strength.

## Mechanical Construction

The truck side-frames are of cast steel, as are the end frames, transoms and other chief parts. Each transom supports the nose of one traction motor through steel springs and also serves as an air duct by which ventilating air from the blower sets in the cab is led to the main motors. Each truck is supported by a combination of semi-elliptic and leaf springs equalized in three groups so as to give three-point suspension. The traction motors are so mounted that the "weight shifting" will be practically negligible regardless of the tractive effort exerted by the locomotive. Provision is made for lubricating most of the wearing parts on the trucks by means of the Dot system of forced lubrication.

The guiding trucks are of novel design. They have outside journal boxes which are interchangeable with those on the driving axles. The truck has provision for lateral motion against a restraining force provided by gravity through a pair of steel rollers and double inclined planes. The truck and centering device are loaded by diagonal equalizers which divide the weight of the locomotive between the main drivers and the guiding truck. All wearing parts in the truck are bushed, fitted with spherical joints where necessary and arranged for easy lubrication through Dot fittings.

Table I—Locomotive Dimensions

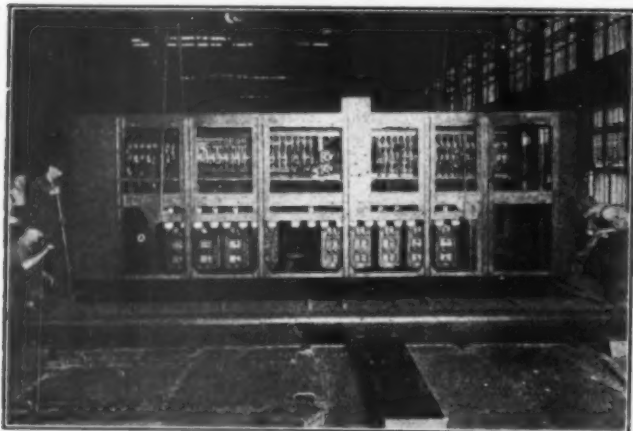
Classification .....	1-C+C-1
Gage .....	5 ft. 3 in.
Total weight .....	294,000 lb.
Total weight on drivers.....	237,000 lb.
Weight per driving axle.....	39,500 lb.
Weight per guiding axle.....	28,000 lb.
Total wheelbase .....	51 ft. 0 in.
Rigid wheelbase .....	13 ft. 6 in.
Diameter of driving wheels.....	46 in.
Diameter of guiding wheels.....	36 in.
Length over-all (inside knuckles).....	58 ft. 8 in.
Width over cab.....	10 ft. 0 in.
Height over pantograph (locked down).....	14 ft. 3 in.
Number of motors.....	6
Type of motors.....	GE-278-B
Minimum radius of curvature.....	300 ft.

individually driven driving axles and is provided with a single-axle radius-bar guiding truck.

Power is obtained from an overhead trolley at 3000 volts, direct current, and supplied to the traction motors which are wound for 1500 volts and connected two in

The cab is of the common steel box type built up of plates and structural shapes on a heavy rigid platform. There is an engineman's compartment at each end, separated by a steel bulkhead from the remainder of the cab. In the middle is a steel compartment 20 ft. long which contains all the control equipment, rheostats, circuit breakers, etc. The spaces between this compartment and the operating cabs are taken up with auxiliary machines.

Aisles extend down both sides for the full length of



The High Tension Control Compartment Being Lowered Into the Locomotive Through a Hole in the Roof

the locomotive and allow free passage through it as well as making all apparatus accessible.

#### Traction Motors

Six 1500/3000-volt forced ventilated railway motors are geared to the six driving axles. These are box-frame motors and are supported on the axles by axle brackets

Table II—Electrical Characteristics

Voltage at trolley (D.C.).....	3,000
Tractive effort, one-hour rating.....	30,600 lb.
Horsepower, one-hour rating.....	2,725
Speed at one-hour rating, full field.....	33.3 m.p.h.
Tractive effort, continuous rating.....	25,900 lb.
Horsepower, continuous rating.....	2,405
Speed at continuous rating, full field.....	34.8 m.p.h.
Tractive effort at 30 per cent coefficient of adhesion.....	71,100 lb.
Maximum operating speed.....	62.5 m.p.h.
Gear ratio.....	77/31
Control voltage.....	65
Type of control (non-automatic).....	Electro-pneumatic Multiple-unit

and bearings, and on the transoms by spring nose supports. The trucks are so constructed that the motors can be easily removed into a pit. There is a forged steel pinion on each end of each armature shaft and these engage twin cushion gears. The gears are made in two parts, a cast steel center and a forged steel rim, which is prevented from turning on the center by numerous leaf springs placed in slots and allowing a small relative motion.

#### Control

The control is of the standard electro-pneumatic type arranged for non-automatic, multiple-unit operation.

Current is collected by means of two air-raised trolleys, either of which has sufficient capacity to supply the whole locomotive.

A master controller is placed in each engineman's compartment. It has a main cylinder with 36 notches, controlling the acceleration and speed of the locomotive while motoring. Three different combinations of the motors are used: for the lowest speed, all six in series; for medium speed, two groups each with three in series, and for the highest speed, three groups, each with two

motors in series. A second controller handle makes it possible to shunt the traction motor fields in two successive steps in any of the running positions. There are thus a total of nine steps in which the locomotive can run continuously.

The field control handle is also used for regenerative braking, in which 15 running steps are available in each of the three combinations.

Two other handles on the master controller are the selector for regenerative braking and the reverse handle.

A high-speed circuit breaker protects the motors and main circuits against any damage from short circuit and also acts as a line breaker, controlled by switches at the operating positions and by overload and over-voltage relays.

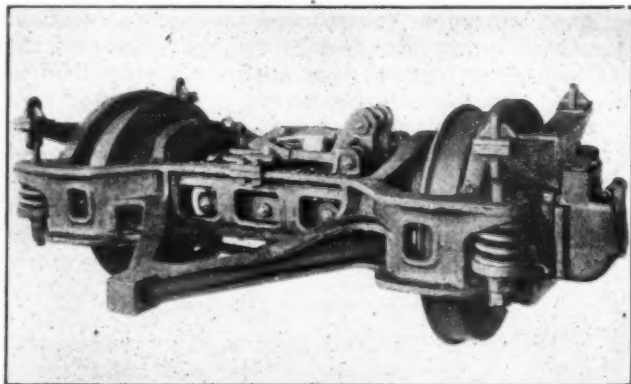
Control couplers are provided, so that two locomotives can be operated from a single controller, giving in effect a unit of 5400 horsepower. Ammeters and voltmeters in the operating cab are arranged in clear view, and there is a watt-hour meter with two dials, indicating separately the power used in motoring and that returned to the line by regenerative braking. Hasler speed indicators and recorders are installed in each operating cab.

#### Auxiliary Apparatus

The locomotive contains a dynamotor, which takes power at 3000 volts and delivers it at 1500 volts for the remainder of the auxiliaries. A small 65-volt generator direct connected to the dynamotor supplies power for the control and lights, through a voltage regulator.

Two 1500-volt reciprocating type air compressors supply air at approximately 70 lb. pressure for the locomotive brakes, the bell-ringer, whistle, pantograph trolleys and control. Two similar exhausters are required to operate the vacuum brakes which are installed on the trains.

Two motor-blower sets supply ventilating air for the traction motors and operate two in series, on 3000 volts for high speed or on 1500 volts for low speed in order to save power. These blowers take air from the cabs, which have large louvers arranged to suck in as little dust or rain as possible. The fans lead into ducts in the



New Type of Guiding Truck

platform, from which the air passes through sliding flanges into the truck transoms and finally into the motors.

The largest auxiliary machine is a motor-generator set operating on 1500 volts from the dynamotor and supplying low voltage to excite the fields of the traction motors during regeneration. The voltage of this generator, and hence the excitation of the traction motors, is varied from the braking handle on the master controller.

The control for the auxiliaries, except the blowers, is



A straight air brake is provided for the locomotive, and also a vacuum automatic brake which acts directly on the train and also controls the locomotive air brakes. Interlocks prevent application of the locomotive brakes during regeneration except when an emergency application is made and in this case regeneration is automatically cut off.

The steel compartment, 20 ft. long, which houses all the high-voltage control and rheostats on this locomotive, was built separately and practically all the apparatus installed in it was wired up before it was placed in the main cab. A large hole in the cab roof allowed the complete compartment to be lowered in and the remaining roof sheets were then added and the whole structure substantially riveted together.

## Wabash Fuel Saving

This represents a decrease for the period of about 18.9 per cent or, as compared with 179.1 lb. in 1923, a decrease of 23 per cent.

Outside of the educational work done by a trained force of traveling fuel supervisors, the principal feature of the Wabash plan has been the keeping of fuel performance records monthly by divisions and presenting both division and system figures on a combined six-year table, illustrated, which receives wide distribution throughout the system and is effective in stimulating a spirit of friendly but active competition in fuel saving. This table shows in detail the division and system figures by months from January, 1923, to date, with spaces left vacant for each month of 1928. The six-year record is maintained by dropping the first or earliest year shown when necessary to add another line for the new year. Copies of the table are posted in conspicuous locations at terminals, repair points, freight yards, dispatchers' offices and in fact wherever it will be seen by railroad men interested.

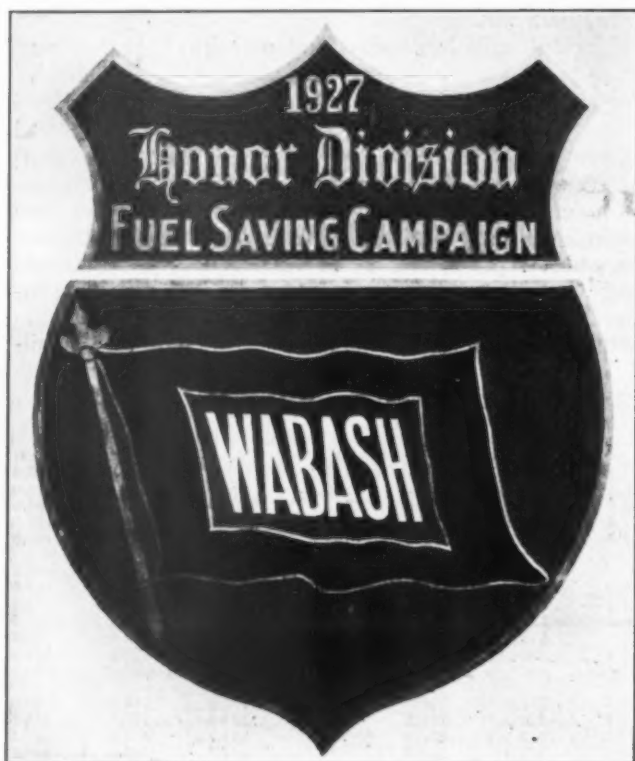
In addition, it is displayed at monthly fuel meetings where fuel wastes are discussed and improvements in practice proposed.

Every effort is made to secure accuracy in the fuel performance data supplied for the table. All figures used are furnished by the accounting department. The gross ton-mile figures are actual, excluding locomotive and tender, as figured by the general car accountant from the wheel reports, while the fuel figures are obtained from the issuance slips to individual locomotives. Interest is not allowed to lag by reason of undue delay in compiling the monthly figures which are generally avail-

Buffalo	Division															
Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1923	158.8	158.3	146.1	139.2	121.6	121.9	114.5	123.5	124.8	123.7	141.5	147.5	134.4			
1924	179.2	134.4	123.8	112.7	105.0	95.9	90.3	88.1	93.8	86.5	100.2	109.2	111.0			
1925	118.6	110.8	107.2	101.1	101.8	100.0	96.9	93.7	100.3	105.9	116.0	113.4	105.5			
1926	123.2	133.1	124.9	111.0	96.6	97.0	97.8	90.2	88.3	94.1	107.5	122.5	107.0			
1927	121.0	118.0	108.5	108.1	102.0	101.0	97.7	92.8	92.4	91.6	103.5	107.8	104.0			
1928	107.2	104.2														
Detroit	Division															
1923	170.9	191.5	176.4	150.9	141.0	142.5	139.9	141.6	145.3	164.2	165.7	161.0	157.0			
1924	188.5	179.6	165.8	166.4	153.2	137.8	137.1	135.1	135.7	131.4	151.7	177.6	155.4			
1925	163.8	156.9	156.1	143.4	133.5	131.1	124.8	117.3	129.3	136.8	147.8	161.0	141.5			
1926	166.0	167.8	167.1	151.5	128.4	127.9	120.5	112.0	121.3	129.9	151.3	168.4	142.2			
1927	159.2	153.8	142.4	143.7	133.1	127.2	123.1	98.4	100.9	104.3	129.4	150.0	129.8			
1928	151.1	147.3														
Peru	Division															
1923	150.1	162.6	154.0	139.9	134.4	131.5	128.5	131.0	136.9	151.5	157.0	158.2	144.0			
1924	188.3	176.5	174.6	168.1	157.5	155.4	140.8	126.3	136.8	135.9	146.8	167.6	156.0			
1925	165.8	149.1	150.6	132.4	124.5	115.5	122.1	148.1	121.0	144.7	147.7	156.8	137.1			
1926	159.5	149.7	151.2	143.2	123.7	115.4	111.2	107.0	120.3	130.2	147.1	163.3	134.9			
1927	160.3	150.4	139.0	145.5	123.0	122.5	123.1	97.1	100.4	103.1	124.9	153.1	128.2			
1928	160.8	158.3														
Decatur	Division															
1923	208.3	222.8	205.0	189.2	179.4	169.3	166.7	169.1	178.3	194.7	195.8	196.7	188.6			
1924	225.2	195.2	181.3	175.6	178.9	162.3	150.3	150.3	158.5	160.9	168.1	206.4	175.7			
1925	196.4	183.4	181.0	158.7	147.9	140.2	136.0	135.4	139.7	156.9	168.5	184.6	160.7			
1926	180.9	165.8	178.9	156.8	137.1	131.1	118.5	120.7	127.8	134.9	162.4	179.5	149.0			
1927	186.0	164.9	152.7	159.9	153.7	144.4	135.3	122.4	116.0	133.2	155.5	176.6	150.6			
1928	171.3	168.3														
Springfield	Division															
1923	256.7	253.2	239.2	219.1	209.8	196.4	187.2	191.3	204.3	226.0	227.6	253.8	220.8			
1924	275.9															

able about the seventeenth or eighteenth day of the following month.

The method of rating individual divisions as regards fuel performance is of interest in that it is based on the percentage of improvement of each division over its own performance for the same period in the previous year, and is no way based on a comparison with other divisions. This method of rating takes care of varying physical factors and gives all divisions an equal chance in competition. Ranking is also based on period performance and not on the individual month. For the month of January, for example, the Springfield division was in first place while in the January-February period it slipped back to second place. The Buffalo division in turn went from second to first place and as the year progresses, the lead will be held sometimes by four or five different divisions for a month or two. The division making the best showing for the entire year is presented with an emblem indicating its high standing in fuel



Shield Awarded Annually in Wabash Fuel Saving Campaign performance, this emblem being patterned in the form of a large steel shield, carrying a reproduction of the Wabash flag in colors. In 1927, this shield was won by the Moberly division.

As a result of this fuel saving campaign, a general and active co-operation is secured on the part of all concerned in an effort to make a creditable performance for their respective divisions. The mechanical maintenance forces on each division try to turn out better cars and avoid train stops and delays on the road where possible; locomotives, thus reducing the number of engine failures and hot boxes; engine crews endeavor to fire and operate locomotives more efficiently; dispatchers are alert to yard crews help in speeding car movement through the freight yards. By attention to these and other important factors bearing on unit locomotive fuel consumption, the goal of 140 lb. per 1,000 gross ton-miles was exceeded in 1927 and a new goal of 135 lb. has been set for 1928. The success of the fuel saving contest as regards road freight service has so far exceeded expectations that the same principle is now being inaugurated with yard fuel.

## Freight Car Loading

WASHINGTON, D. C.  
REVENUE freight car loading during the week ended April 14 amounted to 912,377 cars, a decrease of 37,184 cars as compared with the corresponding week of last year and of 52,417 cars from the corresponding 1926 total. Grain and grain products was the only commodity classification in which loading showed an increase as compared with a year ago. Coal loading, which amounted to 140,672 cars, showed a decrease of only 11,979 cars from the corresponding week of last year, because of the bituminous coal strike which began on April 1, 1927. Loading in the Central Western and Southwestern districts was larger and in other districts smaller than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

### Revenue Freight Car Loading

Week Ended Saturday, April 14, 1928.

Districts	1928	1927	1926
Eastern	217,303	226,011	236,672
Allegheny	192,413	199,147	203,644
Poconong	47,611	59,120	48,859
Southern	147,786	158,750	154,549
Northwestern	109,306	115,317	117,216
Central Western	126,573	125,077	130,769
Southwestern	71,385	66,139	73,085
Total Western Districts	307,264	306,533	321,070
Total All Roads	912,377	949,561	964,794
Commodities	1928	1927	1926
Grain and Grain Products	36,920	34,397	37,734
Live Stock	24,561	25,644	27,303
Coal	140,672	152,651	167,259
Coke	9,908	11,615	12,513
Forest Products	62,441	67,893	75,691
Ore	8,665	12,787	14,003
Mdse. L.C.L.	259,210	264,145	264,919
Miscellaneous	370,000	380,429	365,372
April 14	912,377	949,561	964,794
April 7	919,296	953,907	929,343
March 31	948,427	986,462	928,303
March 24	950,428	1,003,536	967,945
March 17	942,086	1,001,932	977,018

Cumulative total, 15 weeks.....13,621,121 14,444,593 14,063,865

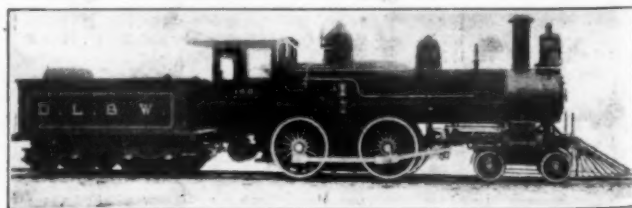
The freight car surplus during the period ended April 8 averaged 344,731 cars, as compared with 344,502 on March 31. The total included 173,815 coal cars, 123,498 box cars, 23,156 stock cars and 13,254 refrigerator cars.

### Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended April 14 totalled 58,976 cars, an increase over the previous week of 2,492 cars and an increase over the same week last year of 4,258 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
April 14, 1928	58,976	38,280
April 7, 1928	56,484	41,796
March 31, 1928	61,398	41,909
April 16, 1927	54,718	44,911
Cumulative Totals for Canada		
April 14, 1928	933,645	596,158
April 16, 1927	905,573	592,183
April 17, 1926	823,093	559,275

\* \* \*



A. D. L. & W. Locomotive Built by the Old Cooke Works, Paterson, N. J.





*Pulverized Coal Locomotive Built by the Allgemeine Elektrizitäts Gesellschaft, Berlin, Germany*

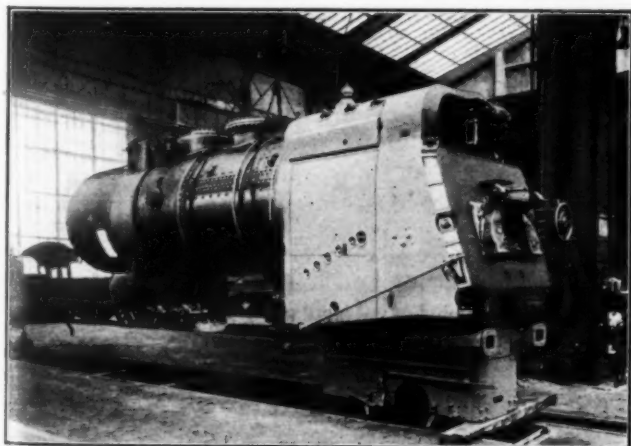
## Pulverized Coal Burning Locomotive Built in Germany

*Reported to be working satisfactorily in freight service  
on the German State Railways*

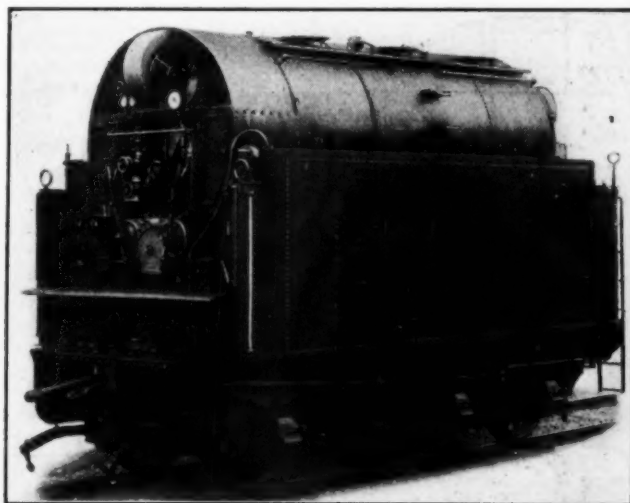
By Dr. Alfred Gradenwitz

IN 1924 the Allgemeine Elektrizitäts Gesellschaft, Hennigsdorf, Berlin, Germany, started developing a pulverized coal firebox for locomotives. A standard freight locomotive boiler was removed from a locomotive operated by the German State Railways and installed in a shed located over a working pit. By the fall of 1926, this boiler had given such satisfactory service that the A. E. G. company proceeded with the design of a pulverized coal burning locomotive. This locomotive was completed the first part of 1927 and placed in experimental freight service in the latter part of July of that year. Since that time the locomotive has been handling freight trains on the main line of the German State Railways between the two points, Berlin and Fuerstenberg, a suburb of Mecklenburg.

As shown in one of the illustrations, this locomotive has the same external appearance as an ordinary locomotive with the exception of the tender, which is rather curiously shaped. The pulverized fuel is in a totally enclosed cylindrical horizontal container, and is mechanically conveyed to the firebox. The pulverized coal burns without smoke and with a total absence of sparks and, it is claimed, gives higher working efficiency than



**Boiler Under Construction Showing the Nozzle and Ash Pan Structure**



**The Tender**

with ordinary grate firing. Poor quality fuel, such as small and waste coal, lignite, peat, etc., can be successfully employed for pulverized coal-fired locomotives, and should effect considerable economies in service.

To ensure perfect combustion of all combustible matter, the flame of pulverized coal furnaces should be so controlled as to have the combustion process finished before the flame comes in contact with colder portions of the boiler. When this is not accomplished, any imperfectly burnt particles are separated in the form of coke.

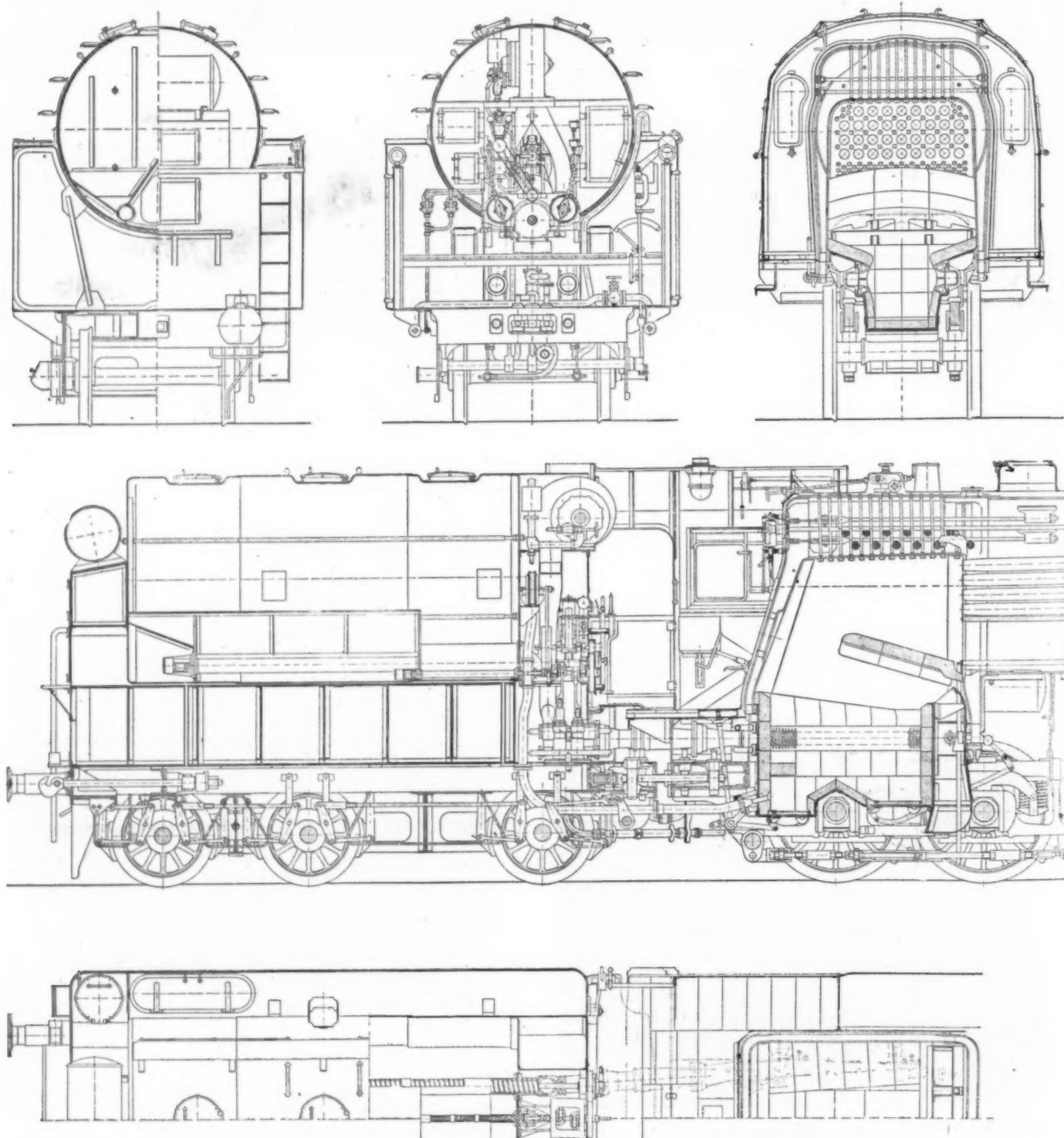
Furthermore, in order to prevent the liquid ash particles from clinging to the brick arch and tubes, these particles should be cooled as rapidly as possible. Pulverized coal furnaces, in order to comply with these conditions should have ample heating surface while the time of combustion should be from one to three seconds.

On account of the limited space available, the in-

stallation of pulverized coal furnaces in locomotive boilers, meets with particular difficulties. The firebox with its water-cooled walls, which, in Europe, mostly consist of copper, will absorb a considerable amount of heat by radiation. This is in turn transferred to the boiler water.

This heat, however, is withdrawn from the flame during combustion. In fact, the possibilities of pulverized coal-fired locomotives have not, as a rule, been considered very hopefully. Locomotives of this type that have been built during the last ten years in the United States and Sweden, do not seem to have given satisfaction, no new units having been added during the past few years.

The efficiency of the boilers in the A. E. G. tests



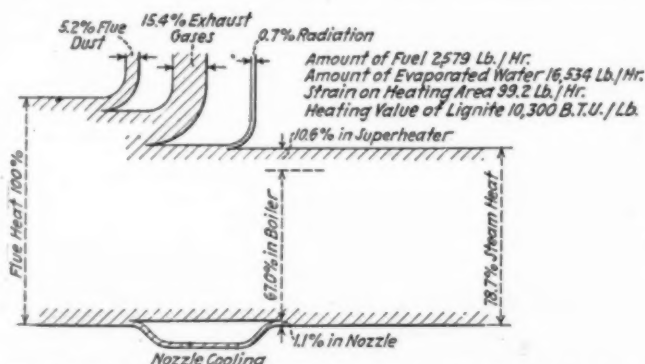
Erecting, Plan and Cross Sections of the A. E. G. Pulverized Coal Burning Locomotive



was raised from an initial figure of 67 per cent until a figure of 74.5 per cent was eventually reached. At the same time, the evaporation was raised to 14.32 lb. per sq. ft. per hour. Difficulties connected with combustion and the production of slag were overcome by choosing convenient nozzles which subdivide the pulverized coal. Especially satisfactory results were obtained in connection with pulverized lignite, to use of which German State Railways attached considerable importance.

#### The Tender and Conveying System

The pulverized coal tender has a bunker space of 424 cu. ft. which accommodates a little over 5.9 tons of lignite. The bunker has the shape of a cylinder about 6.5 ft. in diameter and 13 ft. in length. The two conveying screws, supplying the pulverized coal to the locomotive nozzles, will handle a maximum of 4,629.7 lb. per hour at a maximum rate of 140 r.p.m., the amount of pulverized coal actually supplied being controlled by regulating the number of revolutions of the conveying screws. A blower supplying the primary air is driven by a simple steam turbine, its output being 7 hp. as a maximum. This turbine had to be adopted on account of the very high speed required by the blower which operates up to 4,500 r.p.m. A small reciprocating steam engine is used to drive the slowly rotating conveying screws. At a pressure of 22.4 lb. per sq. in. this engine consumes 66 to 110 lb. of steam per hour. A small auxiliary burner at the rear wall of the ash pan serves as an igniter while the locomotive is standing or drifting, and is intended to make up for the radiation losses of the boiler and supplying steam for the air compressor so that the main furnace need not be operated for these auxiliaries. The auxiliary burner



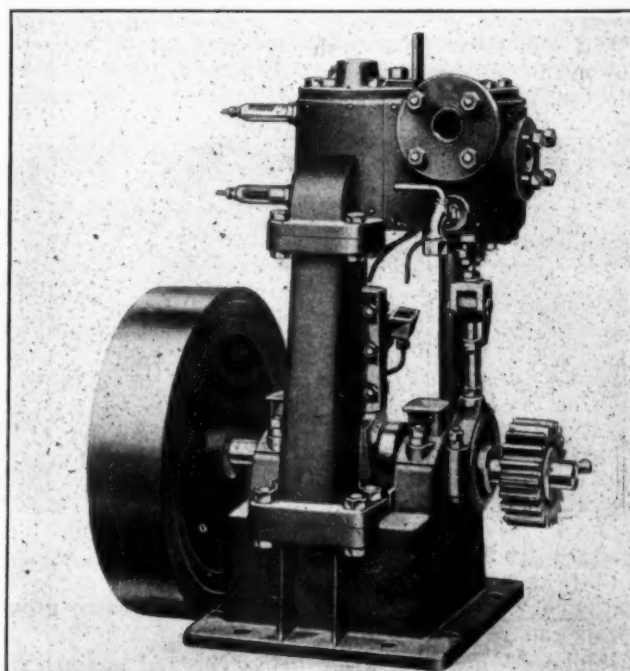
Heat Balance of the A. E. G. Experimental Pulverized Coal Locomotive Boiler

derives its air from a small blower driven by the steam engine on the tender. The surplus weight of the pulverized coal tender, as compared with a standard locomotive tender, is about 4 tons.

The air and pulverized coal mixture which is blown into the firebox contains only part of the combustion air in the form of primary air, the balance, viz. the secondary air being, as in any ordinary reciprocating steam engine locomotive, drawn in automatically from beneath the firebox by the action of the exhaust nozzle. The air and pulverized coal mixture is blown into two long nozzles facing each other from the sides of the pan below the firebox through which it is delivered in a large number of narrow bands. These strike one another in the center of the furnace where a violent vortex is produced. The rising flames strike the preheated secondary air below the brick arch. The combustion chamber proper is surrounded with fire brick, with the arch above and the ash pan below, there being a possibility of heat radiation only on the side walls of the firebox. The hot gases at the end of the long arch are de-

flected upwards at a very high speed which causes the slag particles to be granulated on the crown sheet of the firebox, so that no slag clings to the ends of the tubes.

At the present time the A. E. G. has two pulverized coal locomotives of this design in operation which have, after a few trial runs at no load, been used for hauling freight trains on regular schedules over the Pankow-Heinersdorf - Loewenberg - Fuerstenberg-Mecklenburg-Strelitz line. A standard locomotive has always been included in the train to meet any emergency but no



Steam Engine for Driving the Conveying Screws

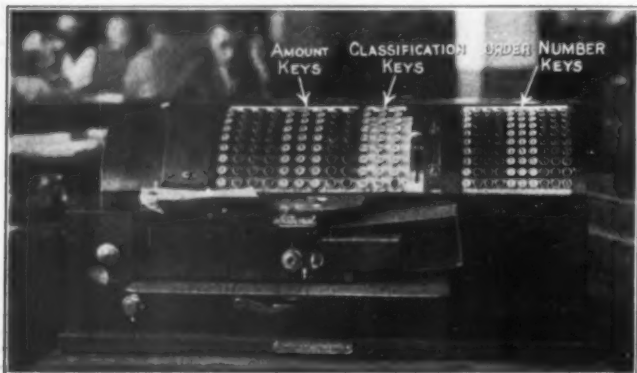
occasion when it has had to be used has ever arisen. The pulverized coal locomotive has frequently pulled trains of 1,300 tons, in addition to hauling the standard locomotive of 115 tons, whereas the maximum tonnage allowed over the entire line is only 1,100 tons. Furthermore, the pulverized coal locomotive could always better the regular schedule time.

It sometimes occurred during some of the test runs, that pulverized lignite and pit coal were stored in layers one above the other in the tender. This condition of changing from one kind of fuel to another in course of the trip never caused any inconvenience. Fluctuations in steam consumption could be easily taken care of under all fuel conditions.

The advantages claimed for the pulverized coal locomotive are as follows: The fuel cost is reduced by the possibility of using a lower grade of fuel, the possibility of using peat or lignite being a particularly valuable feature in German railroad operation. The most satisfactory results were obtained by using lignite, which contains a high percentage of volatile and can, therefore, be utilized to best advantage. The locomotive can use the kind of fuel most easily available and least expensive. The utilization of fuel is more complete than when used in a grate firebox, there being only half as much surplus air, the heating of which is a pure loss. A saving of 20 per cent is claimed for the boiler, which can be fired more rapidly than that of grate firebox boilers. The simple control of the furnace in accordance with the actual steam consumption is particularly important. The time required for cleaning the fire is reduced to a minimum, while there are no fuel losses in discharging the slag.

## Accounting Machine Proves Time Saver in Stores Work

**C**LERICAL work in the general stores office of the Reading has been facilitated by a machine which virtually adds, classifies and prints at the same time. A 75 per cent saving in time is obtained in some of the operations and the work is done more accurately, according to W. H. Morris, assistant general storekeeper. The device, a development by the National Cash Register Company, has 9 rows of keys for registering amounts, and in addition there are 30 keys for classifying the amounts and 10 rows of other keys for printing numbers on invoices or orders. Each classifi-



The New Accounting Machine

cation key accumulates its own total and three group totals can be secured with it.

Shippers' invoices, after being checked against the material received, are prepared for payment in the general storekeeper's office. They are first listed on a ruled form large enough for 38 invoices, which may involve as many as 60 different classes of material. The summarizing of the bills by classes is done on the machine and at the close of each month the machine is again used to arrive at the monthly totals by material accounts, which it does in one operation at a marked saving in time.

Another operation which has been expedited is the handling of 1,500 requisitions issued daily by the locomotive and car shops for bolts, nuts, rivets, etc. Distribution of the charges for this material is now done on the machine at the rate of 2,160 requisitions per hour. At the same time, the charges are classified and the total amount of each class is printed so that it can be furnished to the motive power department with the return of the requisitions for this department's charges to the locomotive and primary accounts. The stores department retains a copy of the classified daily totals and summarizes them on the machine at the end of the month for rendering interdepartmental bills for supplies furnished and for crediting the materials account. This operation on the machine saves several hours a day and provides a more accurate method of securing classified totals.

The Reading manufactures about 3½ million dollars worth of material annually. When the stores department orders shop work, the shop issues a requisition for the raw material. This material is then transferred to the suspense account by an operation which again utilizes the machine which records value, classification and order number in every case. When the labor charges are received from the shops they are placed on

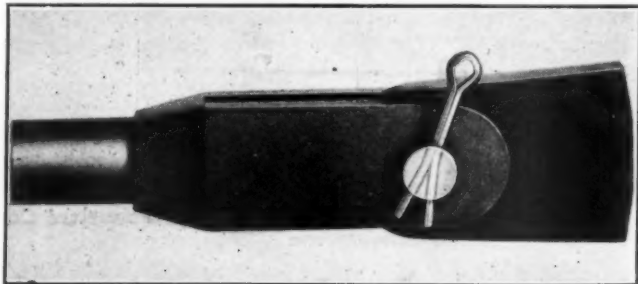
the original order and at the completion of the order, the value of the finished product is transferred from suspense back to the material account, again using the machine which shows the classification.

About 40,000 orders for manufactured material are placed yearly and the details of transfer require approximately 30,000 machine operations monthly. The work is now accomplished in 25 per cent of the time and in addition, the machine accumulates the total for each material class. The practice is to summarize the manufacturing orders whenever a sufficient number accumulates and then to total these at the close of the month. The machine has not only eliminated delays of transcribing but has also reduced the errors in this work.

## A Self-Opening Cotter Key and Pin

**T**HE self-opening, self-retaining cotter key and pin which has recently been patented and placed on the market by the American Railway Products Company, Inc., 74 Washington street, South Norwalk, Conn., is designed to eliminate the troubles often experienced in applying the conventional type of cotter pin. The principle of the design is the formation in the end of the cotter pin of a vee piece, by drilling two outlets which converge into the single hole on the key entrance side of the pin. This opens the cotter key when driven home.

When the end of the cotter key makes contact with the vee piece in the pin, the cotter key is opened and follows the diverging cotters as it is driven home. The cotter key "digs in deep" wherever it is placed and holds tight. This design of cotter key and pin eliminates the necessity of using a chisel to open the key which often leads to a fracture causing it to break. The cotter key



A Self-Opening, Self-Retaining Pin and Cotter Key Applied to a Brake-Lever Connection

is easily applied in out of the way places. A snug fit is obtained when installed, thereby overcoming rattle and vibration. It can be applied to present equipment or new equipment for all types of pins and cotters. Any standard cotter key can be used although the self-centering type in which the split ends of the key are tapered outward, is recommended.

**LOSS AND DAMAGE CLAIMS** paid by the Chicago, Burlington & Quincy in 1927 totaled \$1,068,649, an increase of 3.9 per cent over 1926. These claim payments represent 0.879 per cent of the freight revenues, as compared with 0.825 per cent in 1926. Claims paid on earthenware totaled 17.34 per cent of the revenues received from that class of freight, and on sewer pipes, 15.09 per cent.



# The Outlook for the Railways\*

*Highway competition, rising wage scale, the farm problem  
and high terminal costs endanger railway service*

By F. W. Green

Vice-President, St. Louis South Western

THERE are some clouds on the transportation horizon in the United States which should serve as a warning for every loyal citizen to guard jealously the integrity of the railroads and encourage their continued efficiency. The average citizen's interest in the railroads is even more important when it is considered that transportation has so closely knit the fabric of the economic structure of the country and of the world that any serious impairment or disarrangement of its orderly functioning will be promptly reflected in serious economic disturbance. It has been said many times that the railroads are "the arteries of commerce" and that efficient and economic transportation is the prime essential of our economic welfare.

The extensive construction of modern highways and the general diffusion of wealth within the past few years have diverted from the railways to the highways a large proportion of railway passenger traffic and a considerable proportion of freight traffic, which is reflected in constantly declining earnings of the railroads from these sources. As a result a large amount of passenger train mileage is now being operated at a substantial loss. Any service which is not utilized to the extent at least that the utilization will pay for its cost, is not economically justified. If it is to the public interest to use the highways instead of the railways, it is equally in the public interest for the regulating authorities to permit the railroads to discontinue service which is no longer self supporting. The cost of railway service ultimately comes from the public through rates for service and it is for that reason to the interest of the public that unprofitable service be discontinued.

## The Railroad Labor Situation

Another cloud on the railroad horizon is the labor situation. Disputes between railroads and their employees are subject to the provisions of the Railway Labor Act, which provides, first, for mediation and, second, for arbitration. Almost every arbitration under this law has resulted in an award of higher wages. Arbitration boards have continued up to the present time to award advances in wages, notwithstanding declines that have occurred in the gross and net earnings of the carriers for almost a year. The public cannot view without concern the increasing burden of higher transportation costs which it will ultimately have to bear, resulting from such arbitration awards. A grave responsibility rests upon the United States Board of Mediation, as well as upon boards of arbitration appointed by it under the Railway Labor Act, to appraise properly the effect of increases in compensation, as immediately affecting increased transportation costs, but ultimately, in the larger and perhaps more important sense, as affecting wages in all industries and, consequently, adding substantial increases in the cost of living of the entire country.

An examination of the statistics of the compensation paid by Class I Railways in 1927, recently published

by the Interstate Commerce Commission, indicates that the railways paid an increase in hourly rates of compensation, as compared with 1926, of over \$63,400,000; the average number of hours worked per employee declined slightly, but the average compensation per employee for the year, as computed by the *Railway Age*, was \$1,677 as compared with \$1,656 in 1926. The reason for the increase in average annual compensation, notwithstanding the reduction in the number of hours worked, was that the average wage per hour increased from 64.3 cents in 1926 to 65.7 cents in 1927. There was an increase in the average annual earnings of almost every class of employees. The total wages paid by the Class I Railways in 1927 amounted to almost three billion dollars. The decline in net operating income earned by these roads was about \$148,000,000. Stated otherwise, about 43 per cent of the decline in net operating income may be attributed to the increase in the average wage paid, and the remainder to a decline in the volume of traffic handled.

## Wages Now in Advance of Increased Living Cost

For many years the principal reason advanced by labor leaders in justification of their demands for increased rates of compensation was the increase in the cost of living; that is to say, increases in compensation were necessary in order to bring up the purchasing power of real wages to the equivalent of the nominal wages at the time of the last increase. The cost of living in average American communities, as compiled by the National Industrial Conference Board, for all items, in July, 1920, showed an increase of 104.5 per cent over the cost of living in July, 1914; by January 15, 1926, this increase had declined from 104.5 per cent to 70.4 per cent; and by February 15, 1928, a further decline to 61.5 per cent had occurred. From this it follows that real wages were some 5.6 per cent higher in February, 1928, than they were in January, 1926, even if the nominal wages had not been increased. In some instances railway employees are receiving wages as high as those received at the peak of the cost of living in 1920; that is, their real wages, as measured by the present purchasing power of the dollar, are some 26.6 per cent higher than in 1920, even though their nominal wage rate is the same as in 1920.

We must, of course, consider that there is a natural tendency of railway employees, as well as the most of mankind, to sell services for the highest price obtainable. At the same time, I believe that it is of paramount interest to the railway employees themselves to give careful consideration to the effect upon their own welfare which a continuation of the policy of pressing for wage increases will have. I seriously doubt if it will be practicable in all cases to pass on to the shipper through increased rates for the transportation of freight and passengers, the cost of increased wages. There is already developing a tendency to move manufacturing plants to locations nearer to the source of raw material and at the same time nearer to the center of the market

\* An abstract of an address delivered before a meeting of the St. Louis Railway Club, St. Louis, Mo., on April 13, 1928.

for the manufactured product; for example, within the past few years a large number of cotton mills have moved from New England to various points in the Southeast. Again, there has been a tendency in recent years to construct electric power plants near the source of fuel supply, the power from such plants being carried by transmission lines to manufacturing points, instead of the fuel being handled from the mines by rail and used for power purposes at the point of manufacture.

Moreover, increased transportation wage costs will accelerate the tendency to reduce grades, construct multiple tracks, use heavier locomotives and substitute machines for men whenever the interest on the additional investment can be offset by savings in operating expense, of which wages for labor constitutes the principal item. Money is more plentiful now than at any time heretofore and I believe that in the not distant future it can be obtained in large quantities for 3 to 3½ per cent on long time loans.

In the same connection, the fact cannot be overlooked that the most important industry in this country is agriculture and that, for several years past, it has suffered from a grave depression. The farmer's compensation is controlled by world prices for his product, whereas the compensation of industrial and transportation labor is almost wholly governed by local, or at the most, national influences. With the farmer competing in the world market for agricultural products with agricultural labor throughout the world, on the one hand, and industrial and transportation labor enjoying a highly protective national or local labor market, on the other, it logically follows that under present conditions the farmer, in exchanging his labor for the labor of those engaged in other pursuits, is contributing more than he is receiving when measured in terms of manufactured products. To the extent that this exchange labor ratio has changed to the disadvantage of the farmer, will his dissatisfaction with present conditions continue and the agricultural problem remain unsolved. Agriculture should be given time to become established on a healthy and satisfactory basis before further complicating the situation by additional increases in the cost of wages.

#### Railways Support Five Million People

Of the present population of the United States, about 120,000,000, there are about 1,800,000 railway employees. There are nearly five million people dependent upon the railroads directly for a living. Indirectly, there are probably that many more dependent upon industries manufacturing and selling railway supplies and equipment. But equally important is the dependence of almost the entire population upon the prosperity of the carriers, which contributed, through wages paid employees alone, approximately three billion dollars of the total purchasing power of the country, in 1927.

Any policy which so restricts the earnings and credit of the carriers that they cannot continue to employ labor in improving and expanding the transportation plant, and continue to buy materials and supplies for this purpose, forces them to discontinue both employment and purchases. To the extent that these are restricted, prosperity wanes, and then follows what is usually called a business depression. It is not difficult to apprehend, when we consider that the carriers consume something like 25 per cent of all the coal mined, 28 per cent of all the lumber made, over 30 per cent of the steel castings and over 40 per cent of the brass castings manufactured.

Still another cloud in the railroad sky is the increasing cost to the railroads and ultimately to the public of

providing and operating railroad terminal facilities. The growth of our population, civic pride and inter-city rivalry are creating vociferous and insistent demands for passenger terminals, costing in many instances very large amounts, as much as \$50,000,000 or more, and in a large number of instances \$1,000,000 and more. The construction of these expensive facilities adds nothing to the earnings of the carriers, while at the same time it tremendously increases fixed charges and cost of maintenance and operation. In many instances there have been demands for the elevation or depression of tracks through cities and the separation of grades at highway crossings in the country. To comply with these demands places a heavy burden upon the carriers.

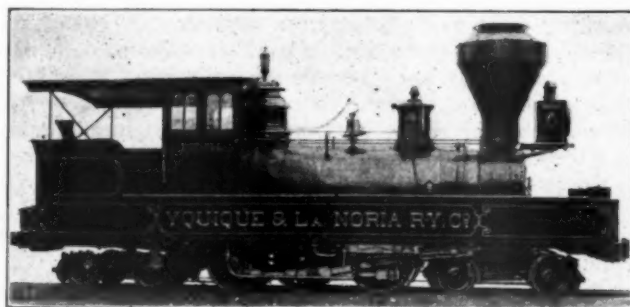
#### The Increased Cost of Operating Terminals

The tremendous increase in vehicular traffic at street intersections where the physical conditions are such that grades cannot be separated, together with the increasing demands of shippers for more frequent switching service, are reflected in substantial increases in operating costs, so that, at the present time, terminal costs probably constitute in many instances the major portion of the total transportation cost. In important terminals like New York, Chicago, St. Louis and New Orleans, the cost of interchanging traffic between carriers and of originating and receiving traffic in the terminal itself, is enormous. The carriers have made much progress in meeting this situation by the construction of outer belt lines and additional facilities, and in many instances industries have greatly benefited themselves as well as the carriers by the removal of their plants to less congested areas.

The fact that the carriers have continued to render the service that they have been rendering during the past few years, in spite of these adverse conditions, is a tribute to their skill and ability, and I have no doubt but that they will succeed in obtaining a satisfactory solution to their terminal problems if they are given the benefit of public co-operation and wise regulation, to the end that their credit may not be impaired by either reduced earnings or increased expenses.

PULLMAN CONDUCTORS are paid at the rate of \$160 a month for their first year of service; \$170 for their second year and thereafter with advances after two years, after five years, after ten years and after 15 years, the rate is advanced to \$193 a month. This schedule of rates is the result of an agreement between the company and the Order of Sleeping Car Conductors which went into effect on March 1, last. For men who have served ten years or less, this is an advance of \$10 a month and for those of longer service, \$8 a month.

\* \* \*



A Locomotive Built for Use in Chile by the Danforth Locomotive & Machine Company



# Atlantic Coast Line Simplifies Stocks of Material



Storehouse Where Standardization Has Emptied Many Shelves of Material

IN the early part of 1927, the purchasing, stores equipment and roadway departments of the Atlantic Coast Line determined upon a concentrated analysis of their stores of materials for the purpose of standardizing them into as few sizes and varieties as possible. It was believed that this would result in a reduced investment in unapplied material, a quicker turnover of stock, cheaper prices and prompter shipments. An organization was formed for the purpose with an assistant general storekeeper assigned to give practically his whole time to the work.

## Eliminate 4,871 Items Out of 19,370

By the end of 1927, a total of 19,370 items of supplies had been studied and this number reduced to 14,499. The extent of the reductions in each case are given in the tabulation.

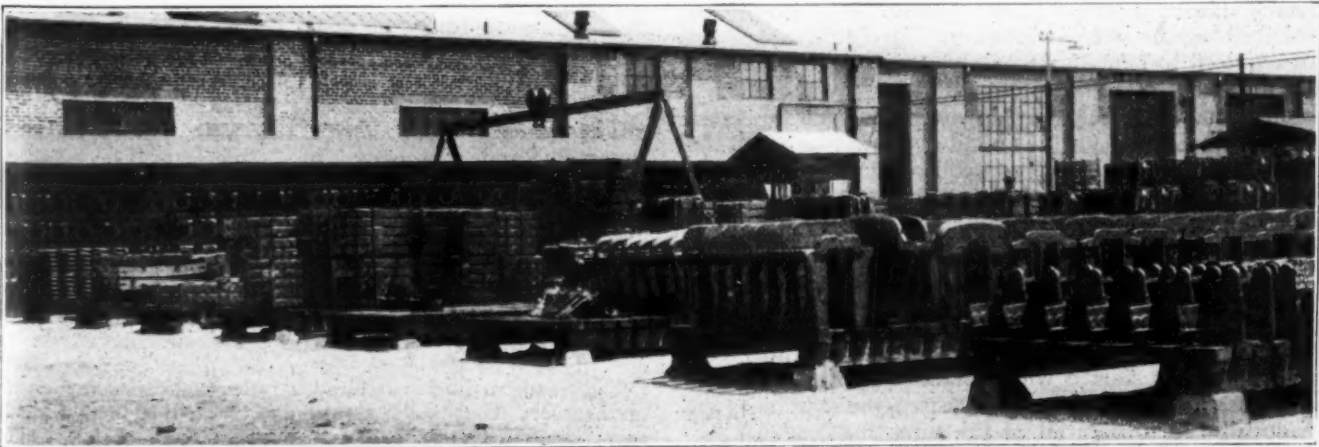
Material	From 1,639 to 1,176 items	Reductions
Air brake material	14	5
Angles, bar mill sizes	18	9
Angles, structural sizes	40	35
Arch brick	130	110
Bars, mild steel flat	15	7
Bars, mild steel square	14	2
Bars, round edge steel	8	6
Billets, steel	254	45
Bolts, carriage	64	00
Bolts, countersunk	84	52
Bolts, engine	55	8
Bolts, lag	854	210
Bolts, machine		

*Launches standardizing program and effects 25 per cent reduction in varieties studied*

By L. F. Duvall

Assistant General Storekeeper, Atlantic Coast Line, Wilmington, N. C.

Bolts, patch	15	00
Bolts, stay	380	149
Brass rods, hex.	9	5
Brass rods, round	11	10
Brass rods, square	3	0
Brass sheets	8	2
Brass tubing	10	0
Bronze rods, hex.	6	0
Bronze rods, round	10	0
Bronze tubing	3	0
Castings, brass	790	586
Castings, car	1,986	1,800
Castings, locomotive	2,428	2,230
Channels, steel	34	11
Copper ferrules	26	5
Copper rods, round	10	3
Copper sheets	13	5
Copper tubing	30	10
Electric material for steam locomotives	733	591
Electric material for cars	1,586	1,416
I-beams, steel	15	6
Firebox steel	34	13
Firmtread steel	6	1
Flange steel	24	10
Forgings, car	2,083	1,446
Forgings, locomotive	1,305	854
Injectors and parts	569	496
Iron, engine bolt, hex.	14	4
Iron, engine bolt, round	22	20
Iron, engine bolt, square	10	3
Iron, staybolt	12	10
Jackets, steel, polished	4	1
Lubricators and parts	503	394
Miscellaneous material not detailed	1,892	1,761
Netting, spark arrester	4	2
Nuts, all kinds	137	101
Pipe, arch	8	6
Pipe, dry	36	9
Plates up to 24 in.	67	40
Rivets	296	107
Rope, wire	7	3
Sanders and parts, locomotive	20	4
Shafting, steel	4	3
Sheets, copper bearing	8	4
Sheets, steel black	28	13
Sheets, steel galvanized	12	5
Slabs, steel	15	6
Steam heat regulators and parts	95	54
Studs, all kinds	136	118
Spring steel, flat	46	26
Springs, all kinds	250	220
Tank steel	30	18
Tees, steel	7	2
Tubes, boiler	65	40



The Procedure of Standardizing Is to Have All Departments Study One Class of Material at a Time

Tubes, boiler superheater.....	31	11
Valves, blowoff and parts.....	49	27
Valves, check and parts.....	80	57
Valves, pop and parts.....	166	119
	19,370	14,499

On February 1, 1927, when the work began, the value of the material and supplies at mechanical stores amounted to \$3,511,250. By February 1, 1928, this had been reduced to \$1,020,735 or 29 per cent. The standardization and simplification work played an important part in this reduction.

#### Index National Standards

The first step taken in the standardization work was to make an index for ready reference, consisting of all the recommended standards adopted by the American Railway Association, Division VI, on standardization and simplification of stores stock, and those published in the Department of Commerce bulletins on simplified practice.

The next procedure was to consolidate the inventories by A. R. A. classes and mimeograph each consolidated class. Copies were sent to the purchasing agent, general superintendent of motive power, mechanical engineer, and all superintendents of motive power, shop superintendents, master mechanics, general foremen and storekeepers for suggestions, not only as to eliminations but as to additions, it being realized that even a consolidated inventory might not cover all items that should be carried in stock.

Each item on these lists was then carefully surveyed to see if it should be adopted or eliminated. Careful thought was given to its use and to the possible substitution of another item in its place. The manufacturer was considered as well as the user so that each item adopted conformed to standard manufacture in quantities. With the return of each list, another list was made of the recommended items to be carried in stock. This list was reviewed by the general superintendent of motive power and the assistant general storekeeper jointly and each item carefully considered for final adoption. When this work was completed for a class of material, the final list was approved by the general superintendent of motive power and the purchasing agent, mimeographed and sent to all officers concerned. Each item was then numbered, an addressograph plate was cut for each, and the stock book and catalog sheets were printed accordingly. In addition to describing the item, the addressograph plates also show, as far as possible, on what equipment or for what purpose the item is used. This information is of assistance in making further eliminations.

A special requisition has been provided for ordering items that are not shown on the standard list. In addition to describing the item in detail on this requisition, users are required to explain why it is necessary to order the item and why a standard item will not answer. The assistant general storekeeper investigates each of these special requisitions and, if found necessary to stock the material ordered for future requirements, the item is then assigned an item number and added to the standard list.

#### Keep Standards Up to Date

Shortly after adopting the first class, it was discovered that certain eliminations and additions were necessary to keep the list up to date, and a monthly correction list was started which made it possible to revise each class monthly. With this system, the standards are practically up to date all of the time.

In order to further the interest in this work, a committee on standards was organized among the mechani-

cal forces at each shop. These committees comprise a representative from each department of work and the storekeeper acts as the secretary. The storekeeper sends copies of the minutes of each meeting to the purchasing agent, general superintendent of motive power, general storekeeper and assistant general storekeeper. The minutes are mimeographed and circulated at every shop in order that each shop can make criticisms or further suggestions on the reports from other shops. These suggestions are reviewed by the assistant general storekeeper, blue prints are checked and a list made of all the practical suggestions. This list is then reviewed by the general superintendent of motive power who makes any corrections necessary and approves the list for final adoption.

To stimulate interest among the various shops, a record is kept of the approved eliminations made at each shop and a report is made to the purchasing agent and the general superintendent of motive power of the result.

At the present time, the work has progressed to telephone and telegraph stocks. Following the standardizing of this stock and other mechanical stock, the plan is to study the maintenance of way stocks in like manner. After a complete survey is made of material for all departments and the catalogs and stock books are completed, it is planned to continue the monthly correction so that the standards will always be up to date and the various committees on standards will also be continued.

## Oil-Electric Locomotive Economical in Service

EVIDENCE of the economy of the oil-electric locomotive is found in a recent analysis made by the Reading Company of the operation of a 60-ton, 300-hp., locomotive of this type over a period of 256 days. The locomotive traveled 28,038 miles with a total of 4,673 working hours. The total maintenance cost during this period was \$2,036.78. The service consisted of switching cars from manufacturing plants and warehouses in the city of Philadelphia, as well as making heavy drags from the piers along the river to the main line. It also performs service in connection with hauling a milk train of approximately ten cars from the center of the city to Falls Creek Junction, a junction point with the main line.

A 65-ton steam locomotive employed in the same service cost \$3,364.56 to maintain for an equal number of working hours during an equal period of time. It consumed \$4,808.52 worth of fuel and lubricating oil as compared with but \$1,703.23 for the oil-electric locomotive.

The oil-electric locomotive was built jointly by the Ingersoll-Rand Company, the American Locomotive Company and the General Electric Company. It is equipped with a 300-hp. Ingersoll-Rand oil engine driving a standard General Electric generator and supplying power to four 95-hp. General Electric traction motors. Standard type M control is used.

The Southern Pacific received a rather unusual compliment on February 3, upon the occasion of the arrival of the new ship "Dixie" at New Orleans. The Louisiana Jockey Club named the third race of that day "The Morgan Line Steamship Dixie Handicap" in honor of the new vessel.



# Further Hearings on Automatic Train Control

*Pennsylvania Railroad announces policy—Will install cab signals, continuous system*

WASHINGTON, D. C.

**D**IVISION 6 of the Interstate Commerce Commission, Commissioners Eastman, Esch and McManamy, on April 23 resumed the hearings, discontinued in February, on automatic train control and block signaling, in accordance with the program outlined in its order issued last August. The principal feature of the February hearings was the testimony of leading signal engineers concerning the experience of their roads during the past two years with automatic train control, as ordered by the Commission (and in certain cases installed by the roads voluntarily); and the first speaker in the hearings this week was A. H. Rudd, chief signal engineer of the Pennsylvania, who described the "coder" system now on that road, which was the one system not reported on in February.

## The Coder System

This system accomplishes the same results as other continuous systems but does so by an entirely different method. The signal circuits are those usually employed, either using d.c. track circuits, or a.c. of any frequency. A "coder" is located at the exit end of each track circuit, and consists of a small motor, revolving a series of cams—each cam causing a certain number of interruptions per minute in the current which is fed into the track. This coder is normally inoperative. When a train enters the track circuit, the track relay controlling the signal opens, and closes a contact by which a circuit is made through the coder which immediately becomes operative and feeds a coded circuit to the track, and, if the signal track circuit is a.c., this track circuit is opened.

If the block in which the coder is located is occupied by a preceding train, which shunts this coded circuit, the train then entering will receive no impulse from the coder and, therefore, a caution slow speed signal. If the next block is occupied, where three-indication wayside signals are used, the cam which provides 80 impulses a minute is placed in circuit, and this number of impulses passes through both track rails under the engine, inducing a current with similar impulses in the pick-up coil, providing an approach signal in the cab.

If the block ahead is clear, the cam which furnishes 180 impulses per minute provides a clear signal in the cab.

The impulses on the engine operate a master relay. Other relays are provided which are responsive to the various codes.

The same apparatus which operates the cab signal operates the automatic stop. The caution slow speed indication is displayed when there is no current on the master relay or when there is uninterrupted current passing through the master relay.

The protection given is the same as that provided by the wayside signals except that, if a track relay fails to open, which would result in a clear wayside signal, the cab signal—no code being present—gives the caution slow speed indication on passing such false clear wayside signal.

Incidental to the operation of the automatic stop, a whistle blows for five or six seconds as the apparatus

starts to apply the stop; and if, during this period, the engineman forestalls, the stop is cut out, and so remains until the train passes a more restrictive indication or in ordinary operation one giving the same indication, in which case, he has to again forestall, thereby providing recurrent acknowledgment.\*

Mr. Rudd after briefly describing the coder system continued:

We started to install on March 22, 1922, with the permission of the commission, three-speed continuous train control, or, as we prefer to call it, speed control, on the Lewistown Branch, which was completed in June costing \$285,000. and placed in service on July 11, 1923, and continued in service until January 17, 1926, costing \$50,000 for maintenance. No wayside signals were installed except at passing sidings, but cab signals giving three indications were used instead of the ordinary automatic block signals on the roadside.

## Three-Indication Cab Signal

We have been constantly developing and since then we have, under order 13413, equipped one division (Baltimore to Harrisburg) with the continuous system, three-indication cab signals, stop and forestaller, known as the "loop" system, and four divisions, with the continuous four-indication cab signals, stop and forestaller, (the coder system), and are now in process of changing the other division to conform with these four, making them identical not only with each other but with several roads such as the Long Island, the Central of New Jersey, the Reading and the New Haven, so that our locomotives will be interchangeably operative over those railroads.

The installation of these cab signals was voluntary.

The cab signal giving three indications, as stated, was first installed on the Lewistown Branch on July 11, 1923, this being the first signal of the kind ever placed in actual service on a railroad. It is the direct outcome of the Commission's order 13413, issued June 13, 1922, and it is doubtful if it would have been developed as it has been had this order not been issued. The device was unknown to the Commission when it issued the order, it being first put in service thirteen months after the issuance of the order.

## Why Coder Was Developed

This three-indication cab signal could not be satisfactorily used where a.c. propulsion of trains was employed, because all the track rails on all the tracks are electrically connected to provide return current to the powerhouse, and the loop would have been ineffective. The coder was developed to meet these conditions, and further tests showed that it could be used without change of equipment on the locomotive not only with d.c. track circuits or a.c. track circuits of any frequency in common use, for operating the signals, but also where a.c. propulsion, d.c. propulsion (experiments being carried on on the Long Island Railroad) or steam propulsion was in service.

Our lines from Philadelphia to Paoli and Philadelphia to North Philadelphia being electrified it appeared that for our needs some universal system must be adopted, and the coder as described gave the answer.

## Agreement With Other Roads

After negotiations with other railroads, it was decided that the same number of interruptions for the same indications would be used on the Long Island, the Central of N. J., the Reading, and the New Haven, and eventually on portions of the Lackawanna; and it is expected that this month the cab signals with stop and forestaller will be put in service on the New York & Long Branch, over which many of our locomotives run.

In addition to standardizing on the number of interruptions, it was also necessary to standardize on the frequency of the

\* The coder system as installed on the Pennsylvania is described with illustrations in Railway Signaling for April, 1928, page 125.

coded current to be used, if the locomotives were to be interchangeably operative. and 100-cycle was adopted, these other roads agreeing. A further advantage of the coders is that, if they are equipped with cams as indicated, the locomotives equipped with two-indication, three-indication or four-indication cab signals, will operate over the wayside equipment properly and interchangeably.

With this system engines may be equipped with two, three or four-indication cab signals only, or with the stop and forestaller only, or with one, two, three or four-speed control, with or without cab signals, without any change in the wayside equipment, and by providing additional engine equipment over and above that required for cab signals without discarding any of the basic electrical apparatus on the engine, providing additional pneumatic equipment if required.

Also, in connection with the cab signal, a whistle may be substituted for the stop and forestaller.

### Analysis of Accidents

We analyzed our collision record from July 1, 1911, to June 30, 1927, and are now convinced that had the cab signals been invented and in operation as described the most serious of these accidents would not have occurred.

During the five-year period, 1923 to 1927 inclusive, during which our block system has covered more than 99.7 per cent of the passenger mileage, we have had two serious collisions—one at Plainsboro on our New York Division, and one at Gray, on the Pittsburgh Division, both of which would undoubtedly have been prevented by cab signals. Except for these two, only two passengers have been killed in collisions in five years. It is the opinion of our management that the cab signal is one of those "other safety devices" which the Commission has authority to order installed, and which was developed and made available subsequent to the original order in this case.

Most collision accidents occur because of lack of continuous and correct information in the locomotive cab of conditions ahead. Consequently, the logical thing is to bring the information into the locomotive cab by both visual and audible means where it cannot be hidden by fog or storm, nor misinterpreted by a well-meaning engineer, nor missed or neglected by the negligible number of careless ones, and in addition provide an absolute check by the fireman.

### Cab Signal Gives Four Indications

The cab signal, as we use it, is capable of giving four indications—clear, approach restricting, approach and caution slow speed, comparable with the indications given by the automatic block fixed signals, except that caution slow speed is displayed instead of stop and proceed, or, with our grade signal, proceed at slow speed without stopping. In either of these latter cases, the action required after passing the fixed signal is proceed at not exceeding 15 miles an hour. . . .

Of course, any system of cab signals must be supplemented by way side signals at points where a train must stop and stay until authority to proceed is received, but, where considered desirable, these cab signals may be utilized in lieu of the automatic wayside signals and distant signals for interlockings.

Two of these signals are provided in each engine cab, one for the engineer and one for the fireman, and in lieu of the stop and forestaller, we desire to install a whistle blown by the full air pressure available on the engine, which would sound on each change of the cab signal to a more restrictive indication and continue so to sound until the engineer acknowledged by shutting it off, his failure to do so immediately causing the fireman to take action which the automatic stop is intended to do, but substituting his intelligence for the mechanical action of the automatic stop.

Cases where the engineer and fireman are both incapacitated while the engine is in a condition so that it can continue to run are almost if not entirely unknown.

### Advantages of Cab Signal

The cab signal is now recognized as one of the most important developments and advances in the art of signaling. It provides the engineer with a means for knowing the condition of the track in advance, and, therefore, makes him more competent to handle his train safely under all conditions. We believe it has contributed more safety than any development in the art of train control. By its use the engineer is not only apprised of any wreck which may short circuit the track ahead in the block in which he is running or the next block, an open switch or other obstruction which affects the track circuit and coder circuit. It also gives him a more favorable indication if conditions change ahead—in short, he carries with him the indication which he would have received at the signal in the rear had he been approaching it at the time the change took place, thereby, in many cases, expediting traffic.

The Commission has emphasized the fact that the object of

the device it requires is to insure that the engineer is alert; obviously recognizing the fact that the control of the train should be preferably left in his hands. . . . With 100-car freights an emergency application of brakes may result in a wreck. It is the practice of engineers handling these heavy trains to avoid the use of the train brake whenever it is possible to do so, and they frequently run more than 100 miles without ever using it. When approaching an approach signal, the engineer closes his throttle and drifts, using the independent brake on the locomotive to finally stop the train if it does not stop of itself. On heavy descending grades, the retainers are turned up on a specified number of cars in the rear and the train brakes are used, but, in effect, this reduces the length of the train. . . .

The point may be raised that, unless the automatic stop is used, engineers may get in the habit of running too fast under an approach signal, where several are displayed in succession, as a constant practice, forestalling may become a more or less perfunctory or subconscious act, but the cab signal gives the engineer a constant reminder under such conditions that the signal ahead is at stop. . . . [The speaker here referred to the report on this subject presented at the last meeting of the Signal Section, A.R.A., showing a large number of accidents which might have been prevented, either by an adequate manual block system, other adequate signal system or a cab signal system. See *Daily Railway Age*, March 7, 1928, p. 560-D95.]

Our management is very strongly of the belief that the cab signal system with whistle and acknowledger, which we wish to use, (and which has been operating so satisfactorily in our present train stop installations) is the correct answer for our conditions, and as shown above would undoubtedly have prevented the few serious accidents we have had in the past.

### What the Engineers Think

In order that we might feel assured that we had not made any mistake in our analysis of the situation, we have within the past month taken a poll of the engineers qualified to run over our train control installations. The question submitted was: "If you could have only one of them, which do you prefer, the cab signal with whistle or the stop and forestaller?"

Of the men running over the continuous system territory, 1170 voted for the cab signal; 95 for the stop and forestaller; 7 for both; 8 undecided; and 1 not voting.

Of the Erie & Ashtabula division engineers, 36 running regularly, and 120 qualified to run over the New York Central between Girard Junction and Erie, which engines are equipped with the intermittent stop and forestaller without cab signals, and where the men have had no experience in actually operating under cab signals, so that their vote must be considered only as an opinion, 155 voted for the cab signal and 1 for the stop and forestaller.

These opinions confirm the opinion of our management, which is, in short, that the cab signal, which was unknown when the original order of the Commission was issued and has been developed since as a result of that order, is one of the "other safety devices" which the Commission is authorized by law to order installed, and is superior in its results to the devices originally ordered in at a time when this device was unknown, accomplishing the same result as the stop and forestaller, giving additional information and, we think, in a better way.

### The Pennsylvania Record

On behalf of the Pennsylvania and the West Jersey & Seashore, Mr. Rudd submitted a statement (supplementing what had been sent in as a response to the commissioners' questionnaire), outlining what has been done toward equipping the lines with safety devices, in part as follows:

On December 31, 1910, the Lines now operated in the Pennsylvania Railroad System had 77 per cent of the passenger lines operating under a block system. Early in 1911 orders were issued by Mr. Atterbury, then general manager, that all passenger trains should be operated under a block system. At the end of 1923, 99.7 per cent of the passenger lines were under the block system, and at the end of 1927, 99.94 per cent—the small remaining mileage being close to terminals.

Of this 99.94 per cent of track under block, 8,905 miles is manual or controlled manual and 5,187 automatic; on the latter being superimposed approximately 1,492 miles of automatic stop and forestaller, with cab signals, the total number of locomotives equipped being 1,026, exclusive of 38 used on the New York Central between Girard Junction and Erie, and 63 equipped for the New York & Long Branch, which we equipped at the request of the other railroads and without any order of the commission.

For the eight years 1920 to 1927, inclusive, we hauled 1,151,266,452 passengers—of this number a maximum of 32



were killed in collisions. I say "maximum" because the statistics available do not show whether the two passengers killed in 1920 and the two in 1921 were killed in collisions or derailments.

Out of 703,208,176 passengers carried, 1923 to 1927, inclusive, with a total passenger mileage of 24,566,902,300, the total passengers killed in these five years in collisions was 23, or 1 out of 30,574,268, and, taking the passenger miles traveled, the expectancy of the passenger for safe transit alive would be 1,068,126,187 miles. Also in these five years the passenger-train mileage was over 64,000,000 per year.

### Position-Light Signals

Thirteen years ago we began installing position-light signals, without moving parts, and which have great visibility in fog and any adverse weather conditions, and which give the same indications night and day. Our last statistics show that, of the 17,698 high signals in service, 5,587 are position-light, and of the 4,798 dwarf signals, 3,040 are position-light, and we have never, so far as our records show, had a single case of such signals being missed in automatic signal territory, over 50 per cent of which has position-light signals. We have gradually reduced our false clear signals not only by these methods but by the installation of a.c. track circuits in foreign current territory, and at present we have in service 1,899 miles of track with d.c. track circuits, and 3,288 miles of track with a.c. track circuits.

All our main line interlockings and most of the others are equipped with approach locking to prevent an operator from inadvertently changing a route. A great percentage of these also have electric switch and route locking in place of the old detector bars.

### Record of Automatic Signals

For the eight years 1920-27 inclusive, our automatic signals have detected 3,446 broken rails; 281 cases of track fouled by cars on sidings; 579, repairs to track; 516 switches left unlocked; 335, improper interlocking machine manipulation; 197, other causes; total 5,354 credits to the system, or an average of 670 such occurrences a year.

We, therefore, submit that our present system, with operation under our rigid rules, is reliable and entirely adequate, except to guard against the rare instances we have had where the engineman, on account of weather conditions, or possibly incapacitation, missed the signal or misread it or accepted the signal on an adjoining track when the fireman at the same time failed to check him.

In view of the safeguards just described, and especially the fact that all passenger trains, and except for 927 miles where no passenger trains are run all freight trains are operated under some form of block system, it is not necessary to install automatic signals, especially on thin lines, as a safety measure.

It is our practice when traffic increases to such an extent as to render manual block operation unduly expensive, to install automatic signals, first, in order to reduce this expense, second, to expedite traffic, and, third, to secure some added protection.

As an example, on our St. Louis Division, February, 1927, the gross ton-miles per train-hour were 18,800, whereas, in February, 1928, after the installation of automatic signals on the double-track portion, the gross ton-miles per train-hour were 24,100, an increase of 5,300, or 28 per cent, at the same time eliminating the cost of operating a number of block stations.

We have installed in 1925, 1926 and 1927 automatic signals on 591 road miles, 1,268 track miles, at a total cost of \$4,053,000, of which 315 miles of road and 607 miles of track was in connection with the installation of train control, and will this year substitute position-light signals and A.C. track circuits for semaphores and D.C. track circuits between West Philadelphia and Wilmington, and West Philadelphia and Elwyn, total of 28 miles of road and 87 miles of track.

We have also substituted electric lights for oil lamps in nearly all our signals where commercial or our own power is available, and approach lighted signals on single and double track lines in many places by using primary battery where power is not available.

We have spent \$2,216,000 on new interlockings, or a total for additional railroad signaling of \$6,269,000.

Incomplete figures show an expenditure of \$943,000 for highway grade crossing protection, representing 221 new crossings protected and the substitution of horizontal flashing lights for bells or other devices at 298 additional crossings.

During the five years, 1923 to 1927, inclusive, we have spent for our share of the elimination of grade crossings—Investment in Road and Equipment only—\$13,131,660, an average of \$2,626,332 per annum—\$6,468,387 having been spent in 1927.

During the five years, 1923 to 1927, the cost of operating and

maintaining our improved safety devices was as follows:

Account 249—Maintenance of Signals & Interlockers (including Expense charges in connection with new work).....	\$27,937,786
Account 404—Signal and Interlocker operation.....	21,273,368
Account 405—Crossing Protection .....	18,961,426
Total .....	\$68,172,580
An average of \$13,634,516 per year.	

As to our future policy: It is the intention to equip with automatic signals portions of the St. Louis division double track, and application has been presented but not yet acted on for equipping 73 miles of the double-track portion of our Cincinnati division this year, with the expectation of equipping the single-track portion next year. Applications are also being prepared for equipping the unequipped portions of our line between Harrisburg and Sunbury, 43 miles of road.

Authority has been granted and work started on automatic signals between Bayard, Ohio, and Rochester, Pa., 55 miles of double track.

We have agreed with the Baltimore & Ohio to install automatic signals and revise interlockings on our joint tracks from Newark, Ohio, to Columbus, 33 miles, double-track, and expect when this is completed to voluntarily install our coder system in this territory, as all our locomotives using these tracks are equipped with cab signals, stop and foretaller, and, by filling in this gap, we shall have such protection continuously from Pittsburgh to Indianapolis.

We have also agreed with the B. & O. to equip our joint tracks with automatic signals from Akron Junction to Warwick, 15.6 miles of double track.

We have an agreement with the Department of Highways of Pennsylvania for the protection of grade crossings of our railroad and the state highways as may be decided necessary by the Public Service Commission, under which the state pays one-half and the railroad company one-half. These applications are constantly coming in, and many have been granted.

We have been and are gradually increasing our inter-track spaces from originally less than 12 ft. to 12 ft. 6 in. and latterly to our present standard of 15 ft. between main tracks, and, in common with many other carriers, are installing heavier rail, larger tie plates, heavier bridges, replacing wooden structures, etc.

### Cab Signals for N. Y. Division

As evidence of our confidence in the cab signal as the device which will provide protection and guard against the engineman missing the signal or misreading it, or accepting the signal on an adjoining track, when the fireman at the same time fails to check him, we have included in our budget for 1928 the sum of \$1,350,000 for the equipment of that portion of our New York division between North Philadelphia and Manhattan Transfer, with the coder system, equipping our locomotives with two four-indication cab signals, and the whistle.

In addition to this we propose to proceed with similar installations on our other main line divisions as rapidly as our finances will permit—all without any additional orders from the commission. [Mr. Rudd here submitted statistics in detail and supporting data, and a copy of rules governing operation under the cab signals, stop and foretaller, together with rules covering detours, etc.]

Replying to questions by the commissioners, Mr. Rudd said he believed the roadside apparatus of the coder system no more liable to failure than roadside signaling apparatus now in use. He quoted statements of percentages of trips, during the development period, when the train control had to be cut out of service, which showed constant betterment over a period of 11 months. Many improvements in detail have been made since the system was first put in service. Broken rails may be detected in some cases where the simple track circuit would not detect (as in the case of a break occurring after the train had entered the block). However, not all broken rails are detected by any system. Over a series of many years the Pennsylvania records show only about one-half of the broken rails brought to light by the signals.

Undesired stops with the automatic train control, causing derailment of cars in long freight trains, at first caused trouble, and there were five cases in four days; but there is now no trouble. There were a few false clear operations; some due to bad workmanship and one or two, of which the cause was not discovered.

Mr. Rudd is not ready (on a busy road) to use A.T.C. or cab signals without wayside signals because of, first,

the inconvenience and delay when the locomotive apparatus is out of order, and, second, the need of wayside signals when a train has to move a considerable distance backward, or when a work train makes irregular movements.

The Pennsylvania is making experiments looking to the perfection of a more satisfactory table of safe braking distances for long and heavy trains.

Following the completion of the Pennsylvania's statement the other roads were called upon according to a schedule mainly alphabetical. Thomas S. Stevens, of the Atchison, Topeka & Santa Fe briefly reviewed expenditures for safety from 1922 to date. In seven years the total for automatic signals and A.T.C. was \$8,309,100. Appropriations for 1928 include \$5,982,300 for elimination of grade crossings and \$56,640 for highway crossing signals.

*Central of Georgia.*—C. E. Weaver, chief engineer, said that no passenger had been killed in 12 years in the kind of accident preventable by automatic train control. Highway grade crossing dangers require the company to spend large sums and the conditions are not believed to warrant additional expenditure for train control at this time. The company has in view some additional installations of block signals.

*Central of New Jersey.*—C. H. Stein, assistant to the president, said that 60 per cent of the company's passenger lines are equipped with signals (92 per cent of the main lines) and this will soon be increased. Over \$4,000,000 has been spent recently for automatic signals and from 1922 to 1927 the road has expended \$5,600,000 for grade crossing elimination, while more work of this character is in progress. The city of Elizabeth desires to eliminate a large number of crossings, which would require an expenditure of \$12,000,000 to \$14,000,000. Because of the large increase in motor traffic and the number of accidents at crossings, Mr. Stein said, the railroads are faced with a major problem. In eight years the company has spent \$20,468,298 for improvements having direct relation to the safety of passengers and employees, and in view of this and the company's financial condition he asked that the commission issue no further order against it relating to automatic train control. The company will soon have three types in use on different parts of its line and has not had enough experience to enable it to decide which it would adopt for further installations.

*Charleston & Western Carolina.*—A. W. Anderson, vice-president, said that the question of safety of passengers is rapidly taking care of itself. Whereas the road formerly carried a million passengers a year the number has dropped to 180,000 and this year may not exceed 125,000, because of the increasing use of the automobile. The company has not had a collision for 16 years and does not believe that automatic train control is necessary.

*Boston & Maine.*—L. Richardson, mechanical superintendent, described this road's experience with cab signals and said that in the next year or so it will be necessary to begin a program of replacement of automatic signals, since 75 per cent of those it now has were installed from 17 to 21 years ago; but no definite program has yet been decided upon. The company desires to obtain additional information as to the possibility of using cab signals without wayside signals.

*Chicago & North Western.*—J. A. Peabody, signal engineer, reviewed the activities of the last few years in special safety measures. In connection with automatic train control the company has spent \$2,698,900 and still larger sums for safety in other directions. At present the highway crossing danger and the need of additional tracks in yards and elsewhere call for such

large expenditures that further installation of automatic train control is not warranted. Net earnings are not now satisfactory. Expenditures for "welfare" activities are becoming quite considerable. The road has cooperated with the government and has put in more A.T.C. than required; and asks that no further order for safety appliances be issued at this time. Asked why, if the road's earnings are unsatisfactory a costly system (G.R.S. continuous) was selected, Mr. Peabody said this system promised the best ultimate results. If further extensions were to be made this system would be used. Pressed for reasons, witness said his road's disapproval of the intermittent type covered all rival systems. Enginemen asked for, and later approved, the taking out of wayside signals.

Mr. Peabody, (as well as all others questioned by the Commission) regarded the problem of danger of derailment by too sudden stopping of long trains as no longer a serious one; and all believe false-clear failures are too few to bring in any new problems.

*Canadian Pacific.*—George Snyder, attorney, said that this company's lines in New England have light traffic, except in freight for a short time in the winter, and its most important need in train economy is for wayside signals on its lines in Canada.

*Chicago, Indianapolis & Louisville.*—C. C. Hine, general solicitor, said this road now has A.T.C. on its more important lines—those producing 60 per cent of its passenger revenue—and the officers believe no more is now needed. The system used is the Miller induction type, one of the latest, and time is needed to fully test it. The road intends to install 56 miles of automatic signals this year. No passenger has been killed in a collision since 1897; and since January 1, 1915, none either killed or injured. As on all other roads, the grade crossing danger calls for large expenditures. E. G. Stradling, superintendent of signals, answered questions about the Miller system. No false-clears reported. Cab signals are not included in the system.

*Chicago, Milwaukee, St. Paul & Pacific.*—J. C. Mill, signal engineer, reported satisfactory results with the Union continuous induction train stop; cost per track mile \$275, plus \$1,800 per locomotive. There is a visual cab signal, of which officers and enginemen unanimously approve. All available funds should be used at present for automatic roadside signals. The stop is less costly than continuous train control, and is a sufficient system. There is no trouble from stray currents. O. N. Harstad, general manager (Eastern lines) believed that from the operating standpoint the experimental stage was not yet past. The witness favors cab signals; considers the forestaller necessary. "Our first need in the signaling field is automatic (roadside) signals; but the grade crossing danger is the great problem. Nearly every morning I receive telegraphic reports of deaths or injuries at crossings."

C. F. Loweth, chief engineer, gave extended data concerning highway crossing abolition plans which the road must tackle in the immediate future. Large projects in Wisconsin, Iowa and Illinois will require the road to spend \$337,000 yearly for several years, and a half dozen large cities are pressing for huge expenditures for track elevation. Over four millions will be called for in or near Chicago. Milwaukee, Minneapolis and St. Paul are calling for large expenditures. Timber bridges needing replacement call for 2½ millions yearly on this company's lines.

*Chicago & Alton.*—R. A. Cook, chief engineer, reported that installation of the National intermittent inductive system, on the second order, would be completed by July 1 next. Of expenditures under the gov-



ernment order over 70 per cent has gone for necessary changes in existing signals. The receivers have had to spend large sums for signals and on highway crossings in the past seven years. Persons killed at highway crossings number 15 times as many as in train accidents. Net earnings are decreasing and the receivers owe \$850,000 today on deferred bills; and they believe the density of traffic is not sufficient to warrant further installation of automatic train control.

**Chicago Great Western.**—This road has no automatic train control. C. L. Hinkle, general manager, said it has 566 miles of automatic block signals and its next need in this line would be the completion of signaling on the southern division. In 1927 \$83,759 was spent for 56 miles of new automatics. The road has much rail of insufficient weight and needs to renew 226 miles of 85 lb. section. Since the amount of money available is so limited the need after track safety is for improving crossing conditions. In addition to heavy expenditures at crossings the company is also called on to make some large expenditures for strengthening its bridges.

**Chicago, Rock Island & Pacific.**—Leroy Wyant, signal engineer, gave figures as to that company's expenditures since 1920 for signals, interlocking, etc., and corrected the figure used in the reply to the questionnaire as to the cost of its automatic train-control installations on two divisions. This now amounts to \$422,579, he said, or \$1,253 per road mile and \$2,894 per locomotive equipped. Commissioner Esch recalled his testimony at the previous hearing that the company does not desire voluntarily to extend its train-control installation at this time but asked which division ought to have a further installation if the commission felt justified in issuing a further order. Mr. Wyant said that the matter would require further study.

**Clinchfield.**—L. H. Phettplace, general manager, said that so many expenditures can be made to better advantage, particularly at crossings, that the company feels that it should not be required to make expenditures for train control.

**Delaware, Lackawanna & Western.**—G. J. Ray, chief engineer, presented a succinct statement showing what this road has done and its plans for the future. The Union two-speed inductive automatic train control is in use from Buffalo, N. Y., to Elmira and work under the second order will complete the system from Elmira to Scranton by July 1 next. East of Scranton it is not certain whether this system will be satisfactory and the commission is asked to make no further order at this time. If not satisfactory the coder system is contemplated; and then the coder system would be substituted for the other through to Buffalo. East of Scranton conditions are more complicated; and east of Dover, N. J., electric propulsion is to be introduced in the immediate future. Electrification of the mountain section—Scranton to Stroudsburg—is also being considered. Automatic train control installed before electrification would be money thrown away. In the past three years \$1,864,000 has been spent on signal improvements and rebuilding, and much work of this kind is now going on. The 256 miles of road with A.T.C. next July will be two-thirds of the main line.

"Automatic roadside signals are reasonably adequate and far more economical than automatic train control." The Lackawanna's accident records for seven years show that possibly train control would have prevented enough accidents to save \$14,000 a year, and possibly have saved four lives; but attention is called to 13 fatalities at grade crossings on this road in one year (1927). The cost of A.T.C. on 141 miles for operating expenses, in 1927, was \$76,000, and adding interest and depreciation this would be increased to \$160,000. Ex-

tending A.T.C. to the eastern terminus (Hoboken) would cost \$2,373,000 and the annual expenses, interest and depreciation would be \$509,000, or for the whole main line \$900,000 a year. "Compare this amazing sum with the actual average cost (seven years) of accidents which might have been prevented, of \$15,000."

The Lackawanna has spent many millions for elimination of grade crossings and is now spending in New York state alone \$2,000,000 yearly. If, notwithstanding this showing, the Commission issues an order, the Lackawanna asks that it be confined to the line between Scranton and Slateford Junction, and that it call for cab signals only.

### Third Day

The Lackawanna's statement concluded the second day's sitting. On Wednesday, C. W. Galloway, vice-president of the *Baltimore & Ohio* supplemented the statement made by the signal engineer at the February hearing. This road in eight years has appropriated \$11,145,714 for elimination of grade crossings, and expenditures of this class in the near future must be very large. Other large expenditures for safety were cited. The road desires to extend automatic block signaling and would spend its funds for this purpose rather than for automatic train stops as these are not yet fully developed. Interchangeability is a large problem, not yet settled. For 1928 the plans call for 204 miles of new automatic signals; cost \$1,319,211. Discussing the importance of having automatic train control uniform throughout the country Mr. Galloway said the running of other roads' trains over B. & O. track had caused delays. The use of locomotives unequipped being forbidden, the rule is interpreted as meaning that the automatic block signals on the A. T. C. line (being in their nature permissive) must not be depended on; and so, with foreign trains on the line, all trains were moved under absolute manual block from tower to tower.

Discussing highway crossing dangers Mr. Galloway said the *Baltimore & Ohio* had innumerable troubles. Its trains strike three automobiles a day (average) and every few days an automobile runs into a train.

Asked about cab signals Mr. Galloway was positively opposed to them. Nothing should be done to take the runners' mind off the road ahead. These (and automatic train control) will increase the percentage of chance-takers in the cabs. The *Baltimore & Ohio* does not oppose automatic train control but Mr. Galloway deems it wholly unnecessary.

**Denver & Rio Grande Western.**—A. O. Ridgway, chief engineer, described the difficult operating conditions on this very crooked and mountainous line. A single train often negotiates a sag and a summit within its own length, and the air brake problem is at all times complicated and difficult. Over-heated wheels are a source of greater danger than the danger of collision from failure to observe signals. Cost of operation is high also because of high cost of coal. The road has made large expenditures for block signals and proposes to spend for this purpose \$583,000 this year.

**Detroit, Toledo & Ironton.**—T. J. Brennan, signal engineer, said that traffic is very light and block signals—let alone A. T. C.—are not needed. The road has expended large sums for separation of crossing grades. Reciting the road's activity concerning safety witness cited the 12-hour maximum day (instead of 16 hours) the 8-hour normal day and the 48-hour week limit. A safety engineer, reporting to the president, is constantly on the road and has authority to discharge employees. The time is not ripe for cab signals.

Further testimony presented on the third day will be published in the next issue of the *Railway Age*.

# George B. Elliott Elected President of A. C. L.

*Company's vice-president and general counsel succeeds to post left vacant by death of J. R. Kenly*

**G**EORGE B. ELLIOTT, vice-president and general counsel of the Atlantic Coast Line with headquarters at Wilmington, N. C., has, as was briefly announced in last week's *Railway Age*, been elected president of the company. Mr. Elliott fills the vacancy occasioned by the death of John R. Kenly on March 1 last.

Mr. Elliott is a native of Virginia, having been born in Norfolk on March 22, 1873. He attended Virginia Military Institute, studying engineering, and was graduated from that institution in 1892 with the degree of Civil Engineer. He then served for a time as assistant resident engineer for the Chesapeake & Ohio — this being his first railroad service. He left this position to attend Harvard University Law School and continued there until he was graduated, in 1896, with the degree of Bachelor of Law. He forthwith entered the service of the Atlantic Coast Line and has been continuously in its service since.

His first position with this company was that of special attorney, which he held for ten years. In August, 1906, he was appointed assistant general counsel and remained in that capacity for ten more years, i.e., until February, 1916, when he was promoted to the position of general counsel. In November, 1918, he was elected also a vice-president of the company, in addition to his duties as general counsel.

This position he held continuously until April 17, of the current year, when he was elevated to the presidency of his company.

The property which Mr. Elliott now heads itself operates a line of some 5,000 route miles and, in addition, is the parent company of a system which controls a mileage of more than 14,000, placing it high in the group of the largest railroad systems of the country. The Atlantic Coast Line serves a territory which has been favored with remarkable economic expansion. The road's share in this growth is evidenced by the increase in its ton mileage from  $3\frac{1}{4}$  billions in 1920 to  $4\frac{3}{4}$  billions in 1926—a growth of 46 per cent in six years. Keeping pace with the growing needs of an advancing community necessitates an alertness to methods of in-

creasing efficiency and capacity. Mr. Elliott comes to the leadership of a property which has established a favorable reputation in its accomplishments in this direction.

The Southeast continues to expand industrially and economically, and the new A. C. L. president will doubtless find that he will be called upon as time goes

on to build still further on the foundation established by his predecessor, continuing the intensive development of the road as traffic demands upon it grow. The Coast Line's recent history has been marked by a steady program of additions and betterments. Considering the nature of its territory and the road's well-established policy of meeting the needs of its patrons efficiently, the new president should find an opportunity for service to the property and to its patrons equally as great as that of his predecessor.

There are, however, other problems of railroad administration besides those of general management and "railroad statesmanship" — as an imaginative grasp of a property's duties and possibilities has aptly been called. Not the least of them is that of intercorporate relationships, and this is particularly true of a system such as the Atlantic Coast Line,

standing as a parent company in a large system. To such tasks Mr. Elliott brings his long years of experience in the company's legal work, whereas his early training as an engineer should help him with some of the other phases of his work.

Mr. Elliott, in addition to his duties as president of the Atlantic Coast Line, holds also the following positions with subsidiary and other companies: president, Atlantic Land & Improvement Company; president, Wilmington Railway Bridge Company; chairman of executive committee and vice-president, Charleston & Western Carolina; general counsel, Atlantic Coast Line; president, Belt Line Railway of Montgomery, Ala.; chairman of board and executive committee, Columbia, Newberry & Laurens; president, South Carolina Pacific; vice-president, Northwestern Railroad of South Carolina; vice-president and advisory counsel, Winston-Salem Southbound; advisory counsel, Atlanta, Birmingham & Coast; and director in fifteen companies.



George B. Elliott



# Front End Blowers as Fuel Wasters

*An efficient device has been the major cause of a reduction of 20 lb. per yard engine-mile*

By J. E. Bjorkholm

Assistant Superintendent Motive Power, Chicago,  
Milwaukee, St. Paul & Pacific

ONE of the greatest, but perhaps least recognized sources of fuel waste on a locomotive is the front end blower. While considerable attention in recent years has been directed towards improvements tending to reduce the consumption of fuel, it appears that this device has been largely overlooked. Various devices, some of which are rather costly and complicated, have been adopted on their merits as fuel saving factors but the front end blower, usually of crude design, has been left undisturbed to do its share in promoting unnecessary fuel consumption.

The front end blower usually consists of one or more ordinary pipe nipples of a dimension usually too large to be efficient or economical, or a so called ring blower with a large number of small holes the number and dimensions of which have usually increased with the smoke inspector's insistence that something be done to lessen the smoke evil. Bad boiler conditions with leaky flues, neglected grates, improperly adjusted front end, air leaks in the smoke box, inefficient firing or any other of the various causes that may result in a poor steaming engine, have too often, no doubt, been responsible for increasing the capacity of the blower with little or no thought of the effect this increase would have on the coal pile.

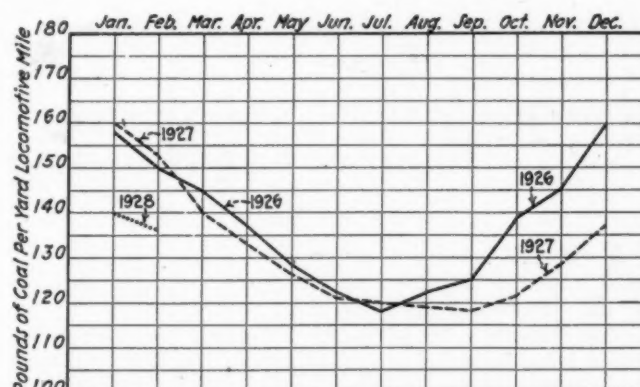
I believe it is generally agreed that the house blowers at an engine terminal are a considerable, and frequently the greatest load on the power plant and, of course, the larger the steam orifice in the blower, the greater the demand on the blower line. The use of the blower is not confined to the actual firing up of the engines, it is also used for ventilating purposes by boilermakers, brick arch men, grate cleaners, flue blowers, etc., and in the aggregate the steam used from this source is considerable.

Through a series of tests and experiments for a period of two years, we have found that the fuel wasted in the power plant because of excessive steam consumption through the blower line, although considerable, is the smallest item chargeable to an inefficient front end blower. It is after the locomotive leaves the roundhouse that the greatest waste occurs.

At first thought it would appear that whatever economy in steam and, incidentally, in fuel may be effected by a restricted blower opening would be confined to the economy in the steam actually flowing through the blower line. This is not the case, however, as less coal is used in firing up a locomotive equipped with a moderately strong blower which properly distributes the draft than is used in firing up an engine with a much stronger blower. The explanation, as I see it, is that a blower of a too large capacity causes entirely too much cold air to be drawn into the firebox while the fuel bed is light and the firebox temperature low, causing a condition very similar to what would be found were we to connect a stationary boiler or an ordinary stove to a chimney excessively oversized.

The prime function of a blower is to create a draft, when a draft is needed, and no exhaust from the cyl-

inders is available for the purpose. The need for the blower after the engine leaves the roundhouse depends largely on the service to which the engine is assigned, and the nature of the surroundings. Thus, in a large terminal and adjacent to or within the limits of a city where smoke ordinances govern, it is usually necessary to use the blower almost constantly in the interest of smoke abatement. In this class of service particularly, the blower is responsible for a considerable fuel consumption. The more inefficient the blower, the greater the waste in fuel. It has been our experience in large terminals with several hundred switch and transfer engines that a reduction in fuel consumption of approximately 20 lb. per yard locomotive-mile has been ac-



Fuel Performance in Yard Service Since January, 1927—  
Chicago, Milwaukee, St. Paul & Pacific

complished since a more efficient blower was adopted and the old one-inch nipple discarded.

With several hundred yard engine assignments this, in the aggregate, amounts to a very handsome saving and while the saving brought about in freight and passenger service has been less, the result has been so gratifying that it has exceeded our most liberal expectations.

The chart shows the trend in fuel consumption in yard service during the period from January, 1926, to February, 1928, inclusive. With the beginning of August, 1927, when the application of an improved blower was made, a substantial decrease in fuel consumption was effected and this has continued during each succeeding month. When it is considered that approximately 830,000 yard locomotive-miles are produced per month, the saving thus made represents something like 8,300 tons of coal monthly, or something like 275 tons per day. The entire saving, of course, cannot be credited to the improved blower, but it is safe to say that the blower is the cause of the major portion of the saving. As previously stated, a considerable saving due to the same cause, has also been made in freight and passenger service.

Regardless of the service to which the locomotive is

assigned, the blower is used during a considerable part of a run or a day's work. Particularly at terminals where roundhouse facilities are inadequate and engines must remain on the outside during a large portion of their time at the terminal, the blower must be frequently used. Careful tests have shown that a blower one inch in diameter, fully opened and with the steam flowing at 200 lb. pressure, will consume approximately 500 lb. of coal per hour. Just as bridging the nozzle is often resorted to the quickest way to fix up an engine not steaming freely, so has an excessive amount of steam through the front end blower too often been resorted to as a means of abating smoke. The results, however, can only be classified as "smoke painting" instead of smoke prevention along scientific lines. Properly drafted locomotives, with a properly distributed air supply plus careful firing, are the best means of preventing smoke and by far the most economical.

Fuel economy is a factor that is being recognized more and more as one of the means of promoting economy in operation. Many wasteful practices still are to be corrected. Excessive and unnecessary use of the blower is an item very much like unnecessary running of the headlight generator. It is practiced entirely too often, and more attention paid to this particular item will bring about surprising results.

## National Railways of Mexico Improve Car Handling

By S. W. Fisher\*

**A**FTER surviving the troubles due to political conditions and the strike of 1921, considerable optimism now prevails as to the future of the National Railways of Mexico. Although the volume of traffic has continued to be disappointingly low, much of

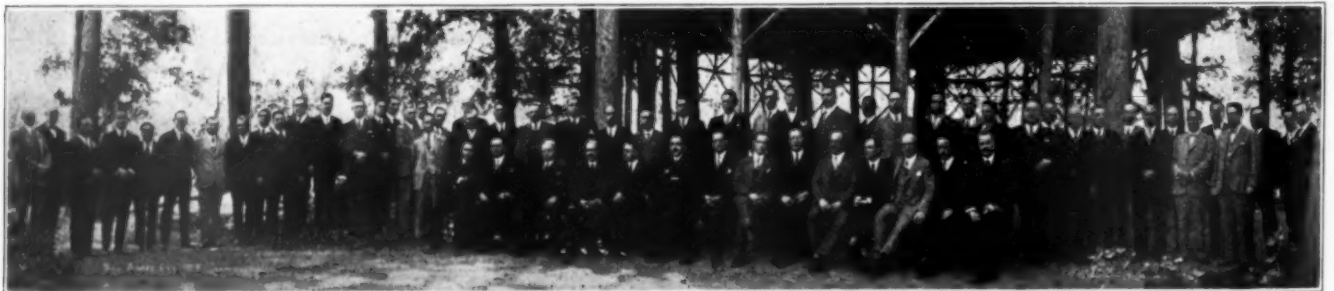
to loaded car mileage is not unduly large. In December for example, the loaded car miles represented 66.5 per cent of the total for all equipment, 67.4 per cent on foreign cars, 68.2 per cent on system standard-gage cars and 73.8 per cent on system narrow-gage cars. Another factor which has shown an improvement of nearly 100 per cent is the average loading, which was 23.4 tons per car in December.

The per diem expense has always been a serious problem, in view of the small amount of equipment owned and the long distances from the border interchange points to Mexico City, to which point most of the imports are destined. None-the-less, during January, 1928, when there were approximately 125 more loaded cars per day on the line than in September, 1927, the per diem expense was \$12,000 less. A comparison with August, 1927 shows that there were 135 more loaded cars on the line per day in January of this year, yet the per diem expense was \$36,000 less.

### How Results Are Obtained

These results are being obtained largely through a campaign of education among the officers and employees. The operating department, as such, has only been organized since May, 1925. After its organization, its officers found themselves beset by the union to such an extent that no less than 80 per cent of their time was spent in settling labor disputes. This was due to the fact that the minor officers did not agree as to the treatment of the employees. There was no uniformity of disciplinary practice as between the various divisions, the result being, naturally enough, that discontent and dissatisfaction existed everywhere. After much effort on the part of the management, a system was established whereby uniformity of treatment is accorded to all employees. The result has been that the operating executives are now required to devote only an hour or two per week to labor disputes.

Another factor in producing a better relationship was



The Mexican Railway Superintendents Convention Was Held in Mexico City in January

the deficit has been absorbed in markedly increased operating efficiency.

Practically every factor of operation shows a decided improvement. In December, 1927, for example, the average miles per car per day, which had been improving all year, reached 34.2, the mileage for standard-gage cars being 38.9 and for foreign cars 52.2 miles per day. The first two figures are held down by the inclusion of the many cars of private ownership, which are entirely under the control of the owners.

These figures become even more creditable when it is considered that the total mileage of lines operated is 7,366, while total equipment ownership is only 1.25 cars per mile of line. Further, the percentage of empty

the inauguration of staff meetings with the superintendent and his employees in attendance. These were supplemented by meetings of superintendents, presided over by a general superintendent. Until recently, such meetings had never been held in Mexico.

Another action of the operating executives which has been productive of results was the inauguration of a uniform system of reports from each division. These statements comprise several new departures in Mexican railway practice, such as figures on overtime payments, fuel consumption and various costs. These latter have been found particularly valuable, since, hitherto, the operating executives have not been in possession of the necessary information to determine whether a train was making money or the reverse.

A campaign was started and is being continued vigorously, for the purpose of acquainting all concerned with

\* At the request of the Mexican government, and later of the Mexican railways, Mr. Fisher, formerly with the American Railway Association, has made two transportation surveys in Mexico in the past few months.



the importance of improving train loading, increasing average miles per car per day and decreasing per diem. The results of this educational campaign, as reflected in the figures given in the first three paragraphs, have been highly satisfactory.

#### Improved Operating Methods

With the political and labor situations on a more nearly normal basis, it has been possible to establish comparatively fast manifest freight service from the border points to Mexico City. For example, the schedule from Laredo is 53 hr., from Matamoros and Piedras Negras 67 hr., and from Juarez, 101 hr. All cars in these trains are traced through to destination and particular attention is paid to any cars that are set out in bad order. Since trains from the border consist largely of foreign equipment, making and adhering to these faster schedules has aided materially in reducing per diem.

A shortage of locomotives has existed on the N. R. M. for many years and a campaign has recently been inaugurated to secure maximum utilization of locomotives. Extended engine runs have been established between Mexico City and the United States border, with the result that 10 engines have been saved. The water problem has been a serious one for years past, but treated water is now being used widely and has reduced locomotive maintenance expense, besides permitting the locomotives to remain in service for longer periods.

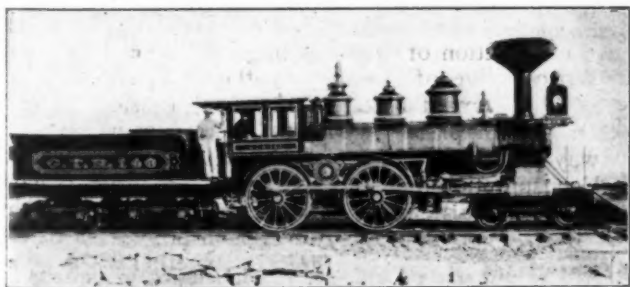
Among the other improvements which have had the effect of promoting operating efficiency is the telephone dispatching system, which has been installed on some of the main line divisions. This has permitted faster movement of trains in safety and has been the means of reducing accidents.

On the whole, traffic on the N. R. M. has not recovered in the expected volume. Car loadings continue to be relatively light in Mexico and the imports by rail are not increasing materially.

The principal internal traffic consists, in general, of ore from Chihuahua, San Luis Potosi, Saltillo and some other mines to the smelters at Monterrey. After refining, it moves to Tampico for export. There is a sizeable seasonal movement of dried beans from Durango to Mexico City and an all-year-round movement of fruits and vegetables from the Guadalajara district.

The railway is making earnest efforts to build up traffic, as is evidenced by the banana traffic from the El Huli district in the state of Oaxaca, southeast of Mexico City. Until a year ago, this fruit moved via boat, but, upon the assurance that the railways could handle it, a trial shipment was made. It proved successful and a schedule of 85 hr. is now being maintained from El Huli to Juarez, 2,440 kilometers, or nearly 1,600 miles. This business now amounts to about 250 cars a week.

\* \* \*



A Grand Trunk Locomotive, Built in Company Shops in 1869

## Railways Object to Subsidizing Barge Line with Traffic

WASHINGTON, D. C.

ALFRED P. Thom, general counsel of the Association of Railway Executives and C. S. Duncan, economist for the association, testified on April 24 at the hearing before the House committee on interstate commerce on the Denison bill to increase the capitalization of the Inland Waterways Corporation to enable it to extend its barge line service. The testimony was largely supplemental to earlier statements in which they urged if further expenditures are to be authorized for a continuation of the barge line "experiment" steps be taken to ascertain the cost of the service under conditions applicable to private operation and that the service be subjected to regulation.

In reply to questions by members of the committee they expressed particular opposition to the amendment suggested by Thomas Q. Ashburn, executive officer of the waterways corporation, providing that if the railways and any water carrier operating on the inland waterways fail to reach an agreement on through routes, joint rates and divisions the Interstate Commerce Commission shall prescribe them. Representatives Denison and Newton insisted that the railways have failed to co-operate with the barge line in establishing such joint traffic arrangements and asked if a mandatory requirement did not seem necessary. They also asked if a shipper should not have the right to select the "cheapest" route.

Mr. Thom said that the committee does not know that the barge line could handle traffic for 20 per cent less than the rail lines without a government subsidy, or if required to pay interest and taxes and make allowance for depreciation, and that, assuming it is not committed to government operation but is trying to ascertain whether the barge line could succeed under the conditions of private operation, it should ascertain that fact before the experiment is continued indefinitely. He pointed out that under the law the railways are not required to short-haul themselves to turn traffic over to other rail lines and that the plan proposed would give preferential treatment to water line competitors. He also emphasized that the public is interested in not having the rail service impaired by reduction of the railway revenues. When Mr. Newton said that it is taking an undue length of time to work out the joint arrangements suggested by the Interstate Commerce Commission Mr. Thom said:

"Great problems like this require time for their solution, but isn't the fact that the barge line is meanwhile receiving a subsidy some compensation for the delay? If it cannot sustain itself without two subsidies, one from the government and another from the railroads by a requirement that they turn over to it traffic they could handle themselves; if the railroads must make a contribution from their own resources to sustain a competing form of transportation, it seems to me that a serious question arises."

Some members of the committee asked if the Ashburn amendment could not be made less drastic, and Mr. Thom said that the present law, under which the commission has discretion to decide what is in the public interest, should be sufficient.

At the suggestion of several members of the committee Chairman Parker stated that a representative of the commission would be asked to testify.

Commissioner Esch appeared before the committee on April 25 but said he was not familiar with the proposed amendment and suggested that Commissioner Eastman be called, because he has three barge line cases on his docket. He said the commission already has power to make a valuation of the property of the waterways corporation, as suggested in an amendment to the bill. The barge line service has been developed as an experiment, he said, and he believed that with time and more progress more could be ascertained about the cost of its service as a basis for rates and differentials. He expressed the belief that there is a function for the inland waterways and that the public is entitled to the benefits of any cheaper form of transportation "under just and reasonable rates."

#### Cost Basis

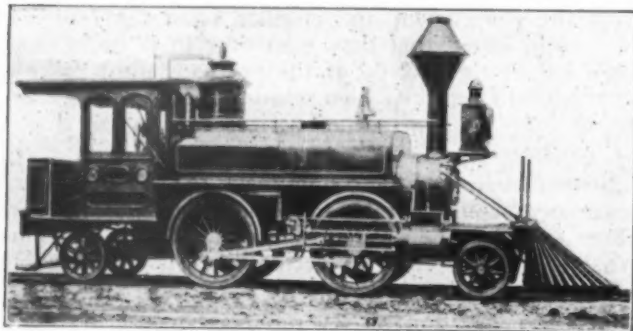
Theodore Brent, formerly traffic manager of the barge line, testified in reply to the statement of C. S. Duncan, economist of the Association of Railway Executives, that the costs of the barge line service are not on a basis comparable with the conditions of private operation. He said this statement "tends to throw a doubt" on the accounting system of the Inland Waterways Corporation, which is that prescribed by the commission for water lines. "There are differences from the very nature of the project," he said, in the accounting for a government corporation and a private carrier, but to the extent that the operations are similar they are all accounted for." He said the barge line has no expense for maintenance of roadbed, because the government maintains the river channel as a matter of public policy, that it has no fixed interest charges because it was financed with stock owned by the government and that it has to pay very little in taxes because the terminals are largely owned by municipalities and the boats are registered with the municipality that gives the lowest tax rate.

He said a reserve of 2½ per cent is set up for depreciation but that it really represents an "obsolescence charge" because the equipment is maintained "in the pink of condition."

Mr. Brent said the mandatory requirement proposed is necessary so that water carriers will not have to spend years in negotiating with the railroads. After the barge line filed its complaint asking the commission to establish joint rates and routes, he said, it took three years to get an opinion, not an order, and then five years more in negotiating with the railroads to get the basis established.

He said the Illinois Central has been cooperating with the barge line but does not seem to want it to "go any farther."

\* \* \*



A "Double Ender" Built by the Grant Locomotive Works, Paterson, N. J., in 1871

## Looking Backward

### Fifty Years Ago

On April 26 the property of the Erie Railway Company was sold at New York under the foreclosure of a mortgage for \$6,000,000 after the date had been postponed more than a half dozen times. The tactics of the parties opposing the reconstruction scheme have been to bring new suits just before the day appointed for the sale which could not possibly be heard fully before the time appointed. This is probably the largest railroad property ever sold at auction.—*Railroad Gazette*, April 26, 1878.

The New England railroads have united to organize a clearing-house association for the purpose of keeping accounts of cars and car-mileage, to date from May 1, with headquarters in Boston. Some are inclined to think that a simple uniform system of daily individual car reports adopted by all our railroads would accomplish about the same results as are contemplated by this clearing house, at far less expense.—*Railway Age*, April 25, 1878.

The freight cars to be attached to the passenger trains of the Chicago, St. Louis & New Orleans [now part of the Illinois Central] for the transportation of early vegetables from New Orleans to the West, will receive freight on Wednesdays and Fridays for Chicago, arriving in that city 48 hours after leaving New Orleans. Cars for St. Louis will arrive at St. Louis 36 hours after leaving New Orleans.—*Railway and Engineering Review*, April 27, 1878.

### Twenty-Five Years Ago

A. T. Dice, superintendent of the Shamokin division of the Philadelphia & Reading, has been appointed general superintendent, with headquarters at Reading, Pa.—*Railway Age*, May 1, 1903.

The temporary injunction against secret reduced freight rates which was issued against the Michigan Central, the Pennsylvania, the Illinois Central, the North Western, the Alton, the Milwaukee, the Santa Fe, the Burlington, the Missouri Pacific, the Rock Island and the Great Western at Chicago on March 24, 1902, was made permanent on April 24.—*Railroad Gazette*, May 1, 1903.

By pursuing a systematic policy the railroad commissioners of New York have abolished 96 grade crossings in that state since 1898. During the past year it has been decided that 15 street crossings in Schenectady shall be changed to subways at a cost of \$920,000, of which the state's proportion will be \$230,000, an amount which is in addition to the usual yearly appropriation of \$100,000 for such work.—*Railway and Engineering Review*, April 25, 1903.

### Ten Years Ago

Following the pledge of 500 hotel and restaurant men to refrain from using wheat in their establishments until after the harvest, a similar pledge was given the next day in behalf of the dining car services of the country by the chairman of the administrative committee of the Association of Dining Car Superintendents. Fifty-nine dining car services have now ratified the pledge.—*Railway Review*, April 27, 1918.

The Railroad Administration took what is probably its most drastic step in the unification of the operation of terminals on April 25 when Director-General McAdoo issued an order directing that, after April 28, Baltimore & Ohio express trains between Washington and New York be transferred from the Central of New Jersey terminal in Jersey City to the Pennsylvania terminal in New York City. This re-routing is ordered to utilize the Baltimore & Ohio trains to capacity, to give the public greater facilities and to relieve the Pennsylvania service between New York and Washington.—*Railway Age*, April 26, 1918.



# Communications and Books

## Age Limit for Retirement

SHREVEPORT, LA.

TO THE EDITOR:

Many of our corporations, particularly the railroads, retire their employees when they reach a certain age, generally 70 years. Would it not be better to base the retirement on efficiency, rather than age?

I know many employees who at seventy years of age are capable of better work than some of their co-workers who have not passed the fifty mark.

Would not the employers benefit by such a change? And it would certainly be better for the employees to remain in the service as long as they can properly perform their duties. It occurs to me that this is a matter that deserves consideration.

From my viewpoint, not age but inefficiency should control retirement.

LINTON W. STUBBS

## Will Not Advise College Men to Become Railroaders

TO THE EDITOR:

I have read with considerable interest from time to time your editorials pertaining to the place of college trained men on the railroad; also various letters on this subject appearing under the head of "Communications". In the *Railway Age* of January 21, there is a letter that especially attracted my attention; a letter citing the fact that ten college graduates eventually left the railroad after two or three years service because of unsatisfactory promotion or being assigned to positions for which they were unsuited.

About a year ago I finished four-and-one-half years of college work in a western University and decided I would like to secure a job on the railroad. Several interviews were arranged for me by my professors with officials of certain western lines who had their headquarters in Chicago. In each case I was told I might have a job at \$87.50 per month; nothing better could be secured even though I had had six years railroad experience before entering the university, and had quit with the expressed intention of bettering myself and reentering railroad service. Now no student objects to starting at the bottom of the ladder. I expected to do this even though I had six years experience to my credit but if a railroad expects a man to begin at \$87.50 per month in a city like Chicago, you can hardly expect him to seriously consider railroad service when he can command \$125.00 per month entrance salary in other types of industry.

The seniority proposition also seems to be a nightmare with some railroad officials. They can't do this and they can't do that because seniority won't permit it, yet it never seems to occur to them they could create a special job for a college graduate and give him a chance to demonstrate himself. In the final analysis the cost of experimentation with a college man on a special job at \$125.00 per month would be no greater than the cost on a routine job at \$87.50 because as one official put it, "you can always get a man to punch the keys of a calculating machine but seldom one to accept responsibility". This same official lamented his inability to get men to accept responsible positions but still was unwilling to do anything to make it possible for a college man to demonstrate his ability to earn a position of responsibility. A college man is not willing to be placed upon a seniority list and started on a salary of \$87.50 because he knows that seniority will keep him down for many years and it may keep him from ever getting the position he wants.

In my present position I am often asked by my students about the possibilities in certain lines of industrial activity. Some are interested in railroads. I also teach a couple of

courses in railway transportation, but until the railroads modify their present attitude towards the college man, I am most decidedly going to discourage young men who wish to enter that field. There must be a change of attitude on the part of most railway officials. The idea that one can learn nothing about the railroad business except via the school of "hard knocks" is not as prevalent today as it was 15 or 20 years ago.

PROFESSOR, BUSINESS ADMINISTRATION.

## Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

### Books and Pamphlets

*Fortieth Annual Report on the Statistics of Railways in the United States for the Year Ended December 31, 1926*, prepared by Bureau of Statistics, Interstate Commerce Commission. The latest I. C. C. "Blue Book". Includes selected data for 1926 for other common carriers subject to the Interstate Commerce Act. 274 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. \$1.30.

*Marketing California Grapes—Summary of Findings*, by Policyholders Service Bureau, Metropolitan Life Insurance Co., from report prepared for California Vineyardists Association. "Distribution costs" p. 12, Packing, p. 15-17, "Operation of grape car plan," p. 19. 22 p. Pub. by Metropolitan Life Insurance Co., New York City. Apply.

*Preliminary Statement of Capitalization and Income, Class 1 Steam Railways in the United States, Year Ended December 31, 1927*, by Bureau of Statistics, Interstate Commerce Commission. Statement no. 2860, fourth in the series. Important financial statistics. Pub. by U. S. Govt. Print. off., Washington, D. C., 35 cents.

*Railway Consolidation Bill*. Report from Committee on Interstate and Foreign Commerce, House of Representatives to accompany H. R. 12620. Discusses necessity for legislation, "our present railroad problems on p. 2-3, and analyzes bill, full text of which is on p. 28-35. Minority views, p. 36-42. House rept. no. 1264, 70th Cong., 1st sess. 42 p. Pub. by U. S. Govt. Print. Off., 5 cents.

*The Story of the Bill of Lading*, by Charles W. Braden. Pre-railroad, and history of railroad bills of lading. Issued as Supplement to April 1928, New York Traffic Club Bulletin. 8 p. Pub. by Traffic Club of New York, New York City. Apply.

*Studies in Malaria as it Affects Indian Railways*, by Ronald Senior White. The author is Malaria Research Officer, Indian Research Fund Association and is familiar with malaria control on American railways. Technical Paper No. 258, Government of India Railway Board. 50 p. Illus., maps, charts. Pub. by Government of India Central Publication Branch, Calcutta, India. 5 shillings, 10 pence, or Rs 3, As 6.

### Periodical Articles

*Do Young Men Have the Chances Their Fathers Had?*, by William Dutton. Interview with W. W. Atterbury, President Pennsylvania Railroad. *American Magazine*, May 1928, p. 18-19, 120-129.

*Does Business Want Scholars?* by Walter S. Gifford. The President of the American Telephone and Telegraph Company presents the results of study of the relation of scholarship to success in the Bell System, and concludes "If studies by other corroborate the results of this study....and it becomes clear that the mind well trained in youth has the best chance to succeed in any business it may choose, then scholarship is of importance both to business and to business men ...." p. 674, *Harper's Magazine*, May 1928, p. 669-674.

# Odds and Ends of Railroading

Do the railroads want the college man? Sure. Cheer leading, for example, is good practical training for the profession of train calling.

Charles Sasse, engine-house laborer on the New York Central, claims the international railway championship for mustache-growers. When last heard from, Charlie's "soup-strainer" measured 18 in. from tip to tip and was still growing.

The fidelity of the movies to life is not always as close as it might be. For example, in "Man, Woman and Sin," several children are shown gathering huge bagfuls of coal in a railway yard. Several trains pass and each is pulled by an oil-burning locomotive.

Many railways run close to state and county lines, but the Atlantic Coast Line is probably the only railway that actually forms the county line for any considerable distance. Between Kress, S. C., and Salkehatchie, the main line divides Hampton from Beaufort county for some twenty miles.

N. H. Kern, Jr., and C. W. Kern, father and son, are both section foremen on the James River division of the Chesapeake & Ohio. Last year the father won first prize for the best section and the son won second prize. N. H. Kern, Jr., by the way, has five brothers, all of whom are conductors on the C. & O.

## A Job for the Commission

One lone bandit held up a passenger train in Chicago the other night. We'll stand for a lot, but this is going too far. If the police can't stop this thing we'll appeal to the Interstate Commerce Commission and they'll make the bandits pay a tax on every passenger robbed. That'll show them.—*Chicago Tribune*.

## A Locomotive Ambulance

Uncoupling his locomotive from the freight train which it was pulling, Engineer W. F. Beggerow, of the Illinois Central, recently used the huge machine in a 3-mile run as an ambulance in a vain endeavor to save the life of a 10-year-old boy. The victim became poisoned from eating wild parsnips and half-drowned by falling into a creek while out with companions along the Illinois Central right-of-way. After one companion had started to town for help, another flagged the freight train which Engineer Beggerow was running.

## The Boys Are Clever

Railway men have been very active recently in proving their skill at games. First, there is W. S. Bake, land and tax agent, Pere Marquette, who dropped his tee shot into the eleventh hole on the Jungle Country Club course at St. Petersburg, Fla. Next, there is William Craft, an engineman on the New York Central. Bill rolled 12 straight strikes on a bowling alley in White Plains, N. Y., for a perfect score of 300. Last, but equally important, is M. Malzen, assistant engineer of the Illinois Central, who held eight aces in a pinochle game with three general office employees in Chicago.

## Big Ones Get Away

The station master of a railroad town sat in his office making his monthly report. He glanced up and noticed that the through express was due. Suddenly the station was filled with the thundering of the express, but above the noise echoed a wild yell. The station master rushed out to see the cause and an astonishing sight met his eyes. The express was disappearing around the curve, while sprawled out amid a confusion of milk cans lay a young man. His hair was disheveled and his coat torn. Going up to a small boy who was standing by, the station master asked: "Was he trying to catch the express?" "He did catch it," replied the boy, "but it got away again."

## Famed Raconteur an Enthusiastic Listener

A contributor has sent us a Chauncey Depew story, taken from a Detroit paper. It seems that the Senator was coming down from Mackinaw City with H. B. Ledyard, at that time chairman of the Michigan Central, in Mr. Ledyard's business car. In the party was Peter White who was famous as a raconteur of French-Canadian yarns. Mr. Depew importuned him to favor the group with a selection from his repertoire, but he demurred saying that the only one he knew suited to such distinguished company would be marred by the noise of the train. At this the veteran New York Central chairman arose and pulled the communication cord. The train came to an abrupt stop and the conductor ran forward to find out the cause. "We are pausing," said Mr. Depew, "while Mr. White tells us a story."

## The Shortest Name for a Railroad Station?

W. D. Cleveland, signal supervisor of the Oahu Railway in Hawaii, writes to tell us of a station on his line which he believes has the shortest name of any station in the world. The name is doubly peculiar in that both of its two letters are vowels and are identical. The name is *Ii* (pronounced ee-ee) and Mr. Cleveland sends along an operating timetable to prove it.

Other stations on the line have naval names, one being called Submarine. Mr. Cleveland assures us that this name is derived from a submarine station adjacent and not from the contour of the track at that point. The Oahu Railway probably enjoys the distinction of being the only 3-ft. gage line in the world which is 33 per cent automatically signaled. It also has 13 miles of double track out of a total of 70 route miles.

## An Appropriate Name for a Railroad Yard

The names chosen by railroad men for new yards or stations are not always indicative of the greatest imaginative effort. That there are some, however, which show real study is well evidenced by that applied by the Lehigh & New England to its terminal development in Eastern Pennsylvania, viz. Tadmor. Students of the Bible will recognize the original Tadmor as a city built by King Solomon to further commerce with the North and East, which, we take it, is exactly the purpose of the modern Tadmor.

Moreover, that a name with such significance could be chosen from the Bible rather than elsewhere is doubly happy in the present instance, since Biblical names for cities are almost the rule in Eastern Pennsylvania, as such names as Bethlehem and Nazareth testify.

## The Russian Kaleidoscope

Nikolai Carol von Meck, once one of the richest men in Russia, a railroad magnate with a pre-revolutionary fortune estimated at \$300,000,000, is now getting \$200 a month as technical advisor for the soviet government in the construction of the Volga-Don canal. Von Meck, who since the soviet regime has dropped the "von" from his name, is 64 years old and acknowledged as the greatest transportation genius in the country. Although all his business and personal property was confiscated, he has elected to remain in Russia and face the new music. Recognizing the value of his services, the soviet government employed him in various expert capacities in connection with the railroad and timber administrations. His job on the Volga-Don canal directs the destinies of the largest soviet transportation plan. The canal, costing \$50,000,000, will give shipping on the Volga river a direct outlet to the Black Sea through the river Don.

Before the revolution, Meck owned in his own name and directed the operation of the entire Kanzan railroad from Moscow to Turkestan with a trackage of more than 10,000 miles.



# NEWS of the WEEK



The Southern Pacific San River Bridge in Arizona

FIRE of undetermined origin destroyed the coach repair shop of the Great Northern at Hillyard, Wash., on April 2 with an estimated loss of \$100,000. Five passenger cars were in the building at the time of the fire.

THE HOUSE committee on interstate and foreign commerce on April 18 voted to refer to a subcommittee the Pittman Bill, passed by the Senate, to relieve certain classes of short line railroads from the operation of the recapture clause of Section 15a of the interstate commerce act.

THE PACIFIC RAILWAY CLUB will hold its next meeting on May 10 at the Hotel Oakland, Oakland, Cal., when a paper will be read on "Detailed Costs of Yard Operation" by J. P. Quigley, superintendent of transportation, of the Western Pacific.

THE SOUTHERN PACIFIC, the Union Pacific, the Pacific Electric and the city of Los Angeles (Cal.) have entered into an agreement for the unification of the railroad lines serving the Port of Los Angeles. The railroad port facilities that have been pooled will be known as the Harbor Belt Line Railroad.

SENATOR BROOKHART, of Iowa, on April 9 introduced in Congress a bill, S.3945, to amend the consolidation provisions of the transportation act to provide that "any proposed consolidation" under Section 5 "shall provide for consolidation of railway properties into a system extending from the Atlantic to the Pacific coast."

BEN C. LARKIN, chief elevator accountant for the North Dakota Board of Railroad Commissioners, has been appointed a member of the board to fill the vacancy left by Frank Milhollan, its president since 1921, who resigned on April 1 to engage in private business in Omaha, Neb. Fay Harding has been elected president.

A MEASURE calling for the voting by the Canadian Parliament of an additional \$3,500,000 for the completion of the \$30,000,000 railway viaduct in Toronto was introduced in the House of Commons last week by Charles A. Dunning, Minister of Railways and Canals, and after considerable discussion progress was reported on the measure.

THE INTERSTATE COMMERCE COMMISSION has modified its standard time zone order so as to except a portion of the Seaboard Air Line (which it acquired from the Georgia, Florida & Alabama) from the Georgia-Florida state line to Bainbridge, Ga., from the central time zone and include it within the eastern time zone for operating purposes.

THE CENTRAL RAILWAY CLUB of Buffalo will hold its next meeting May 10, at the Hotel Statler, Buffalo. It will be known as "Traffic Night." M. Metzger, transportation assistant to the president, New York Central, will talk on "Transportation". The Pullman Quartette of Chicago will be present and will present several selections.

THE BACK BAY STATION of the New York, New Haven & Hartford at Boston, was destroyed by fire on Sunday morning, April 15. Trains on both the New Haven and the Boston & Albany were blocked for several hours. This station, one mile west of South Station, the Boston terminal, was built in 1899 at a cost of about \$500,000. Immediately opposite, on the north side of the six tracks of the two railroads, is the Trinity Place station of the Boston & Albany.

THE HOUSE on April 24 passed the Jones-Reid flood control bill, which had previously passed the Senate, authorizing the appropriation of \$325,000,000 for flood control works in the Mississippi Valley to be carried out by a board composed of the chief of engineers of the Army, the president of the Mississippi River Commission and a civilian engineer. The bill as passed is in a form opposed by the President, partly on the ground that it would lead to expenditures far beyond the amount authorized and also because it does not provide for local contributions to the cost.

THE ST. LOUIS RAILWAY CLUB, at its meeting on April 13, elected the following officers for the ensuing year: president, R. J. Lockwood, assistant manager of the United Railways Company; first vice-president, T. J. Frier, purchasing agent of the Wabash; second vice-president M. W. Dancy; third vice-president, W. G. Vollmer; secretary-treasurer (reelected) B. W. Frauenthal, general traffic agent of the United Railways Company.

THE NUMBER OF RAILWAY EMPLOYEES in the United States as of the middle of the month of February was 1,608,374, a decrease of 6.52 per cent as compared with the number in February, 1927, and a decrease of 7.19 per cent as compared with February, 1926, according to a statement issued by the Interstate Commerce Commission. The aggregate hours per working day in February, 1928, were 13,770,841, a decrease of 7.77 per cent as compared with February, 1927, and a decrease of 9.56 per cent as compared with February, 1926.

## President Criticised for Keeping Esch on I. C. C.

Senator Dill, of Washington, in a speech in the Senate on April 24, criticised the President for "violating the spirit" of the Constitution in keeping Commissioner Esch, of the Interstate Commerce Commission, in office under a recess appointment after the Senate refused to confirm the appointment. He said he had intended to introduce legislation to make such a thing possible, but had found that apparently the Constitution allows a recess appointment, made while the Senate was not in session, to continue until the end of the session. He said however that the thought persists that "he who violates the spirit of the Constitution is not fit to enforce the laws made under that Constitution."

## Further Hearings on Accounting and Depreciation

The hearings before Commissioner Eastman of the Interstate Commerce Commission on depreciation charges and the proposed revision of the railway accounting classifications are to be resumed on May 17. The program provides for cross-examination of witnesses who have heretofore testified in No. 15,100, relating to depreciation, to be followed by cross-examination as to the accounting rules, further testimony, if any, by telephone companies, and cross-examination on it. After this there will be presentation of evidence on behalf of state commissions and municipalities, presentation of equipment statistics by steam railroads and presentation of evidence on behalf of steam railroads as to the revision of accounting rules, Ex Parte No. 91.

### Verdict Based on Sympathy Reversed

"A verdict based on sympathy reversed," which headed a decision by the Supreme Court of the United States, written by Justice Holmes, reported in the *Railway Age* of March 31, page 764, serves for another opinion, also by Justice Holmes, which was handed down on April 9.

This decision was in an action under the Federal Employees Liability Act wherein an engineman sued for damages on account of injuries suffered from contact with a mail crane or the mail sack hanging from it as he looked from his engine window. Judgment for plaintiff was affirmed by the West Virginia Supreme Court of Appeals. Reversing this judgment, the United States Supreme Court follows a similar case, *Southern Pacific v. Berkshire*, 254 U. T. 415, where it was held that the engineer took the risk. It was held substantially, that the facts in the present case did not distinguish it sufficiently from the *Berkshire* case to warrant making it an exception to the rule there laid down. The railroads are obliged to erect mail cranes near enough to the tracks for the trains to pick up mail sacks without stopping; it is almost impossible to set the cranes so far away as to leave no danger to one leaning out, and it would be unreasonable to throw the risk of a well known incident of the employment, adopted in the public interest, upon those compelled to adopt it.

In the *Berkshire* case the plaintiff's testimony left 14 inches from the end of the crane to the car. Here the plaintiff's witnesses made it ten. The railroad's witnesses with greater plausibility made it appreciably more. The Court said in part: "If there is to be a standard in these cases, and if, as decided, the general rule is that the engineer takes the risk, the railroad should not be made liable for this class of injury except where some questionable disregard of obvious precautions is shown. The plaintiff here as in *Berkshire's* case well knew of the existence of the crane, which had been in place for three or four years. He was an experienced engineer and although here as there presumably, he never had measured the distance, he, like *Berkshire*, knew the fact that it threatened danger." *Chesapeake & Ohio v. Leitch*. Decided April 9, 1928. Opinion by U. S. Justice Holmes.

### Permanent Injunction Restrains Southern Pacific From Aiding Company Union

A temporary injunction, granted on August 2, 1927, restraining the Texas and Louisiana lines of the Southern Pacific from interfering with the activities of the Brotherhood of Railway and Steamship Clerks by sponsoring the Association of Clerical Employees, was made permanent in a decree entered by Federal Judge J. C. Hutcheson at Houston, Tex., on April 19. Judge Hutcheson

at the same time handed down an opinion in which he refused to dissolve contempt proceedings instituted on February 11 against three officers of the Southern Pacific, H. M. Lull, executive vice-president, G. S. Waid, vice-president and general manager, and J. G. Torian, assistant to the vice-president and general manager, after it was alleged that they had failed to abide by the terms of the temporary injunction.

In his opinion Judge Hutcheson declared that "the evidence established a deliberate disregard and violation of the terms of the statute, and, after its issuance, of the temporary injunction by the defendant company through a calculated and studied interference, both with the plaintiff organization and the designation of representatives by the employees. The opinion declared, in opposition to the contention of the Southern Pacific, the railway labor act to be constitutional.

Commenting on the court order of February 11, which allowed Southern Pacific officers 10 days in which to comply with the provisions of the temporary injunction by disestablishing the Association of Clerical Employees as the official representative of the clerks in labor matters or be imprisoned in the county jail, Judge Hutcheson said:

"Nothing in the decree requires the railroad company to recognize the brotherhood any longer than such time as its employees or some of them, in the exercise of the right granted them by the act, shall see fit to have the brotherhood represent them with the full right of the employees either by secret ballot, under the direction of the court, or in any other manner which they may determine, to select another representative."

Attorneys for the railroad contended that court orders cannot force employers of labor to confer or agree with employees' organizations, nor can the present railway labor act give such powers. The only purpose of the railway labor act, they said, was the settlement of disputes by conferences, mediation and arbitration and the railroad, they pointed out, has been willing to confer with representatives of the clerks, but not with the brotherhood. J. H. Tallichet, counsel for the Southern Pacific, announced that the railroad would file an appeal in the United States Circuit Court of Appeals at New Orleans, La., to effect a final settlement of this particular controversy and as a test of the provisions of the railway labor act.

Originally the dispute grew out of a demand on the part of the brotherhood for an increase of 10 cents per hour in the wages of employees classified as clerks. Mediation proceedings failed to effect a settlement of the wage controversy and the Southern Pacific fostered the organization of the Association of Clerical Employees. Representatives of the Brotherhood of Railway Clerks objected to the recognition by the railroad of the association as the official spokesmen for the clerks immediately preceding the granting of the temporary injunction against the association on August 2, 1927.

### Erie Improvements To Cost \$27,000,000

The directors of the Erie have approved a budget of \$27,000,000 for improvements in 1928 to carry forward its rehabilitation program inaugurated in 1927. Inquiries for rolling stock have been sent out to include 35 locomotives of the 2-8-4 type. These are the same type as those ordered in 1927 but will have larger tenders. They are to be used for fast freight service between Hornell and Port Jervis. The new locomotives will have a boiler pressure of 225 lb. per square inch, a tractive force of 71,000 lb., and with booster 85,000 lb., wheel base 86 ft. 7 3/4 in., driving wheels 70 in., cylinders 28 1/2 in. by 32 in., and weight of engine and tender in working order 834,100 lb. The tenders will have a capacity of 20,000 gal. of water and 28 tons of coal. This is, 3,500 gal. and 4 tons more than the capacity of the tenders ordered last year.

Many of the existing locomotives are to be re-equipped with labor saving and fuel saving devices and about 75 locomotives are to be modernized and reconditioned. One new oil-electric locomotive will be bought.

Bids are also being asked for 500 box cars of 40 tons' capacity with steel underframes, and 400 automobile furniture cars 10 ft. high and 40 ft. 6 in. long, 100 automobile furniture cars with end doors, of 50 tons' capacity and 50 ft. long, and 5 depressed flat cars of 100 tons' capacity. In addition 1500 box cars will be rebuilt with end reinforcing and bottom plates on center sills, 296 cars will have 50-ton arch bar trucks installed replacing 30-ton trucks, 200 box cars are to be equipped with metal roofs, and corrugated doors are to be put on 489 cars.

Bids are wanted for 25 steel passenger coaches, 3 steel combination baggage and mail cars, 5 steel express cars, and 2 steel dining cars.

The program also calls for the purchase of one tug for service in New York harbor, the installation of automatic block signals between Meadville and Salamanca, and work on the installation of automatic train control is to be pushed forward.

At Hornell, Buffalo, Port Jervis and Meadville new machinery will be installed in the shops. All along the railroad from New York to Chicago several hundred thousand dollars will be spent for miscellaneous improvements to the track and roadway and appurtenances; 100 miles of new ballast will be put in and the equivalent of 275 miles of ties will be laid. This will fit in with the 1928 program of laying 47,000 tons of new heavy rail. At Port Jervis \$204,000 will be spent remodeling the freight yard; at Susquehanna there will be miscellaneous improvements; at Binghamton \$50,000 will be spent for grade crossing elimination work and the eastbound passing siding will be lengthened for 125-car trains; at Hornell yard there will be numerous track extensions and facilities for handling long fast freight trains; at East Buffalo yard track changes will cost more than \$100,000; additional storage tracks will be built west of



Hertle avenue and \$40,000 will be spent for additions to the stock pens; at Salamanca the tracks will be extended for 125-car trains; at Meadville additional tracks and switching leads will be installed at the west yard and \$90,000 will be spent for a new coal and ash handling plant. At Cleveland work on the remodeling of the Fifty-fifth street roundhouse and coach yard will cost \$190,000 and improvements on Scranton street freight yard \$120,000.

### American Railway Development Association to Meet

The American Railway Development Association will hold its twentieth annual meeting May 9, 10 and 11 at the Hotel Columbus, Miami, Fla. The following is a list of subjects upon which addresses will be delivered during the three days:

MAY 9

"Raw Materials in the Southeast," by Dr. Poole Maynard, Industrial geologist, Atlanta, Birmingham & Coast.

"Research and Agricultural Progress," by S. T. Fleming, assistant to director of the Florida Experiment Station, Gainesville, Fla.

"Meeting the New Competition in Industrial New England," by A. N. Payne, Manager, Industrial and Agricultural Bureau, Boston & Maine.

"A Successful Plan for Industrial Development Through Co-operation with Civic Interests," by H. L. Sovacool, Industrial Agent, Akron, Canton & Youngstown.

"Industrial Opportunities in Georgia," by Charles Collier, vice-president, Georgia Power Company, Atlanta, Ga.

"Marketing Florida Citrus Fruits and Vegetables," by Dr. Burdette G. Lewis, vice-president, J. C. Penney-Gwinn Corp., Penney Farms, Fla.

"The Value of Surveys in Agricultural and Industrial Development," by E. H. Anderson, Manager, Agricultural Relations, New York Central.

"Inspection and Grading of Perishable Products," by L. M. Rhodes, Commissioner, Florida State Marketing Bureau, Jacksonville, Fla.

"Fruits and Vegetables of the Rio Grande Valley of Texas," by F. P. Whitman, Horticulturist, Missouri Pacific-Gulf Coast Lines.

"Northwestern Irish Seed Potato Stock for the South and Southwest," by Fred L. Taylor, Agricultural Agent, Chicago, Burlington & Quincy.

"Selling Agricultural Development Ideas to Women," by Mrs. Edith L. Fullerton, Director of Agriculture, Long Island Railroad.

MAY 10

"Cotton Seed Products in Agriculture and Industry," by Major A. L. Ward, Manager, Educational Department, Cotton Seed Products Association, Dallas, Tex.

"Suggestions from Europe," by G. A. Cardwell, Atlantic Coast Line.

"Meeting Florida's Transportation Needs," by R. A. McCranie, Asst. General Manager, Atlantic Coast Line.

"Sugar Cane and Related Industries," by Judge J. L. Doggett, General Counsel, Celotex Co., Jacksonville, Fla.

"The Value of a House Publication in Development Programs," by K. T. Crawley, Manager, Agricultural and Industrial Department, Chesapeake & Ohio.

"Community Advertising as a Means for Securing Industrial Development," by J. M. Malory, Central of Georgia.

"Legislation Which Will Hasten Reclamation Work Favorable to the Southeast," by J. F. Jackson, General Agricultural Agent, Central of Georgia.

"Colonization Methods of the Southwest," by P. H. Wheeler, General Colonization Agent, Missouri Pacific.

"How Co-operative Marketing Can Help Produce Distributors to Become More Efficient," by J. N. McBride, General Agricultural and Land Settlement Agent, Seaboard Air Line.

"Farm Terracing," by George L. Reed, Agricultural Engineer, Portland Cement Association, Jacksonville, Fla.

MAY 11

"The Search for Traffic," by H. N. Rodenbaugh, vice-president, Florida East Coast.

"Florida," by David Sholtz, president, Florida State Chamber of Commerce, Daytona Beach, Fla.

"Organizing Communities for Forest Fire Control," by S. E. Brookings, director, Natural Resources Production Department, U. S. Chamber of Commerce, Washington, D. C.

"Report of Standard Practices Committee," by E. L. Taylor, New York, New Haven & Hartford.

## Traffic

Establishment of a through route and joint rate on crude sulphur from Gulf Hill, Tex., to East St. Louis, Ill., by rail lines to Baton Rouge, La., in connection with the barge line of the Inland Waterways Corporation, was found desirable in the public interest in a report and order issued by the Interstate Commerce Commission on April 18 on the complaint filed by the waterways corporation. The commission found that a reasonable rate for the service would be 2.5 cents per hundred pounds less than the corresponding all-rail rate and that a reasonable division will be 45 per cent of the joint rate to the rail carriers to Baton Rouge and 55 per cent to the barge line.

### New York Central Train Schedules Improved

The New York Central, beginning April 29, will have three limited trains running each way between New York and Chicago in 21 hours or less. The Wolverine will leave New York at 5:10 p. m. and arrive in Chicago at 1 p. m., the following day. The Fifth Avenue Special will leave Chicago at 10:30 a. m. and arrive in New York at 8:30 a. m. There will be no change in the 20-hour schedule of the Twentieth Century Limited nor in the 20-hour 50-minute schedule of the North Shore Limited, westward and eastward trains.

Among other through train changes are: "The Iroquois," the night train to Buffalo, which will leave New York at 11:20 p. m., as compared with its previous leaving time of 12:01 a. m.; "The Genesee," which will leave at 11:05 p. m., as compared with its former departure at 11:45 p. m., and the "Fort Orange," the night train to Albany, which will leave at 11:45 p. m., as against its former leaving time of 12:45 a. m.

A new eastbound train is scheduled. This has been named the "Onondaga" and will leave Buffalo at 5:15 a. m., and arrive at New York City at 4:00 p. m. This train will carry coaches, parlor and dining cars and will make stops at Rochester, Syracuse, Utica and Albany.

Another change will be arrival in New York of the "Southwestern Limited" from St. Louis, at 15 minutes earlier than formerly, its new arrival time being 9:50 a. m., as compared with its previous arrival at 10:05 a. m. The trains, as referred to, are operated on Eastern Standard Time.

### Faster Schedules on Pennsylvania

Under the new schedule of the Pennsylvania's Manhattan Limited, which has been cut one hour, the train leaves New York at 6:15 p. m. instead of 6:10 p. m. and arrives in Chicago at 2:05 p. m. instead of 3:00 p. m. Returning, it leaves Chicago at 10:30 a. m. as previously and

arrives in New York at 8:35 a. m. instead of 9:25 a. m. The Pennsylvania Limited leaves New York at 12:05 p. m. instead of 1:00 p. m. and arrives in Chicago at 7:55 a. m. instead of 8:55 a. m. The Metropolitan Express leaves New York at 8 a. m. as previously and arrives in Chicago at 7:00 a. m. instead of 8:00 a. m. A new train leaves Chicago at 11:20 p. m. and arrives in Springfield, Ohio, at 9 a. m. and Dayton at 7:30 a. m.

The Gotham Limited leaves Chicago at 9:00 p. m. instead of 9:15 p. m. and arrives in New York at 6:50 p. m. instead of 7:10 p. m. The Juniata, now the St. Louis section of the Gotham leaves St. Louis at 4:50 p. m. instead of 4:40 p. m. and arrives in New York at 6:50 p. m. instead of 7:50 p. m. The American leaves St. Louis at 9:00 a. m. as previously and arrives in New York at 9:50 a. m. instead of 10:05 a. m. The Keystone Express leaves St. Louis at 9:10 a. m. instead of 8:30 a. m. and arrives in New York at 2:10 p. m. as previously.

The Red Arrow leaves New York at 3:15 p. m. instead of 2:25 p. m. and arrives in Detroit at 8:45 a. m. instead of 8:15 a. m.

### Exhibit of Advertising Posters of Foreign Railways

The library of the Bureau of Railway Economics is holding in the Transportation Building, Washington, D. C., a second exhibit of advertising posters of foreign railways, similar to the one held a year or so ago, which includes examples of the work of prominent artists, including members of the Royal Academy, the Royal Institute, and the Royal Water Color Society. The exhibit is to be open April 12 to 30 and railway men visiting Washington are invited to examine it.

The exhibit includes 291 posters, including examples of those used by the railways of Canada, Europe, India, Manchuria, South Africa, and Tasmania, many of them embodying original ideas and a large proportion of them representing a higher quality of art than is ordinarily employed for advertising purposes in this country.

### Quicker Schedules on B. & M.

The new spring schedules of the Boston & Maine effective April 29, show several improvements with the seasonal adjustments, in addition to the establishment of the "Flying Yankee" as a non-stop train on the Boston-Portland run, 15 minutes faster in each direction. Nearly all train departures are advanced one hour in accordance with the railroad's practice to operate trains on eastern standard time as a means of minimizing the disturbance caused by daylight saving.

The "Berkshire Flyer," forenoon train out of the North Station for western connections, will be made 11 minutes faster. Eastbound, the "Berkshire Flyer" will be made 30 minutes faster.

The present 1.15 p. m. Boston-Portland train will make the run with a saving of 15 minutes. A speeding up of the mid-day train from Boston to Intervale, N. H., of 29 minutes is announced.

## Foreign

### Chinese Eastern Railway

That marked growth was experienced in traffic and revenues of the Chinese Eastern during the past few years is indicated in recently published data on the operations of that road during the year 1926.

This railway which was opened to traffic in 1903 remains the most important route in Northern Manchuria where it serves a rich agricultural district. Its length is 2,800 versts or 1,872 miles.

During 1926 total freight carried amounted to 327,600,000 poods (5,913,180 tons) while 3,271,000 passengers were transported. These figures compare with a 1925 figure of 263,800,000 poods (4,761,090 tons) for freight and one of 2,454,000 for passengers carried. This increased tonnage amounts to more than 20 per cent over the 1925 figure whereas the normal rate of growth since 1922 is reported to be approximately 11 per cent.

Net profit figures are also on a similar trend being 25,000,000 roubles for 1926 as against 22,300,000 in 1925 and 15,700,000 in 1924. Expenses have also been controlled so that an increasing percentage of gross revenues is being carried to net profit. In addition improvements are indicated in operating efficiency as seen in locomotive utilization and increased tonnage per loaded car. A movement has also been inaugurated to provide shorter hours and improved working and living conditions for employees.

### London to Edinburgh Non-Stop Run

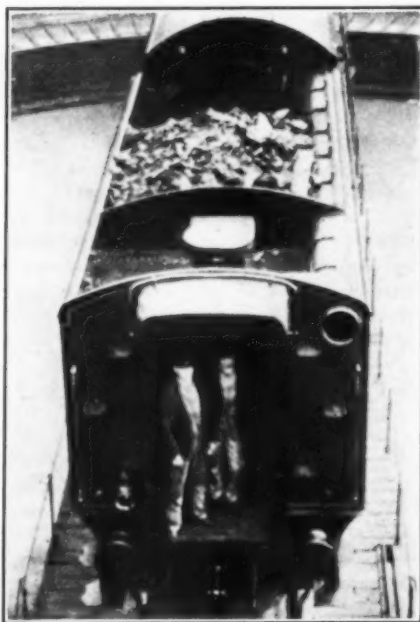
The London & North Eastern will begin operation of a 392-mile non-stop run from London to Edinburgh when the "Flying Scotsman" makes its first trip May 1, without a stop between the two crews, en route, without stopping the



The Corridor Opening on the Foot Plate End of the Tender

cities. In connection with this service, a feature is the tender built for this run. In order to take care of changing engine

train a tender has been constructed with a corridor 5 feet high and 18 inches wide along one side of the tender, for the relief crew to pass through. The length and capacity of the tender have not been altered and the extra room needed for the corridor was obtained by a slight increase in the height and width and by rearrange-



View Showing Corridor Along One Side

ment of the coal space. The rear of the tender is provided with a Pullman vestibule.

The new non-stop run will be the longest in the world. A year ago, when the "Flying Scotsman" was operated to Newcastle without a stop, that was named as the longest non-stop run. During the past winter this former record has been exceeded by the London, Midland & Scottish "Royal Scot" which has been running non-stop between London and Carlisle, 300 miles. The new "Flying Scotsman" schedule will exceed its last summer's non-stop record by 124 miles and that of the L. M. S. by 92 miles. The new service does not cut the time of the present run between London and Edinburgh, the attraction for the passenger being that he will travel to his destination without interruption or disturbance of any kind, a consideration that has been growing in importance in England.

Some construction details of the tender may be seen in the accompanying illustrations, reproduced from the Railway Gazette (London) and in the April 7 issue of the *Railway Age*, page 827, there was published the reaction of a British railway labor paper, the *Railway Review* to the first announcement of the tender with a corridor, the reaction taking the form of a cartoon.

THE SEABOARD AIR LINE is inquiring for 200 tons of steel for a bridge in Florida. This road recently placed a contract for 150 tons of bridge steel, with the Virginia Bridge & Iron Company.

## Equipment and Supplies

### Locomotives

THE ERIE is inquiring for 35, 2-8-4 type locomotives and 1 oil-electric locomotive. About 75 locomotives are to be reconditioned and modernized. Details of the Erie improvement program will be found else where in this issue of the *Railway Age*.

THE TAMPANGA SUGAR DEVELOPMENT COMPANY, Philippine Islands, ordered 2 Mogul type locomotives from the Baldwin Locomotive Works.

### Freight Cars

THE SOUTHERN PACIFIC is inquiring for 50 caboose cars.

THE UNITED SUGAR COMPANY of Mexico is inquiring through the car builders for 10 cane cars of 40 tons' capacity.

THE ST. LOUIS-SAN FRANCISCO is inquiring for two underframes and superstructures for automobile cars.

THE SOUTHERN COTTON OIL COMPANY Savannah, Ga., is inquiring for 20 tank cars of 8,000 gal. capacity.

THE SOUTHERN PACIFIC has ordered 175 tank cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of March 17.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for 2 flat cars of 100 tons' capacity. This is a revision of its former inquiry for 5 flat cars reported in the *Railway Age* of April 21.

THE PACIFIC FRUIT EXPRESS has ordered 400 steel underframes for refrigerator cars, from the Pacific Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of March 31.

THE ERIE is inquiring for 500 box cars of 40 tons' capacity, 400 automobile furniture cars 40 ft. 6 in. long, 100 automobile furniture cars 50 ft. long of 50 tons' capacity and 5 depressed flat cars of 100 tons' capacity. Repairs will also be made to 2,485 box cars.

THE CUDAHY PACKING COMPANY has ordered 100 underframes for refrigerator cars, from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of April 7.

### Passenger Cars

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for five horse express cars.

THE ERIE is inquiring for 25 passenger coaches, 3 combination baggage and mail cars, 5 express cars and 2 dining cars.



THE CHICAGO, SOUTH SHORE & SOUTH BEND is inquiring for 10 motor cars with an option on 5 additional cars and 5 trailers.

THE SOUTHERN PACIFIC is inquiring for six dining cars.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 1 combination baggage and mail car from the American Car & Foundry Company.

## Machinery and Tools

THE BOSTON & MAINE has ordered a Stanley No. 10 drill and a Stanley No. 20 drill, from the Niles-Bement-Pond Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a 36-in. Aurora drill, from the Niles-Bement-Pond Company.

THE NEW YORK CENTRAL has ordered 2 Ransom grinders and a 24-in. Aurora drill, from the Niles-Bement-Pond Company.

THE TEXAS & PACIFIC has ordered a 53-in. tire mold mill from the Niles-Bement-Pond Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered one 3-motor 5-ton 54-ft. span gantry crane from the Whiting Corporation. An order for a 36-in. Niles Acme shaper has been given to the Niles-Bement-Pond Company. This road is now inquiring for one 6-ft. radial drill.

## Iron and Steel

THE BANGOR & AROOSTOOK has ordered 300 tons of steel for a bridge in Maine, from the Bethlehem Steel Company.

THE CHESAPEAKE & OHIO is inquiring for 150 tons of steel for a bridge at Richmond, Ind.

THE LEHIGH VALLEY is inquiring for 1,000 tons of steel for a bridge at Newark, N. J.

THE SOUTHERN ordered 200 tons of steel for bridges, from the Virginia Bridge & Iron Co.

## Signaling

THE CANADIAN NATIONAL has ordered from the Union Switch & Signal Company 18 wigwag signals for highway crossings, and other material, all to be installed on lines east of Quebec.

THE CANADIAN PACIFIC has ordered from the Union Switch & Signal Company, 24 searchlight signals to be installed between Place Viger, Quebec, and Mile End.

THE MICHIGAN CENTRAL has ordered from the General Railway Signal Company, material for crossing protection at Belt Line Junction, Detroit, Mich. The order includes five table interlockers, six switch machines, 13 color dwarf signals, two triangular color-light dwarf signals, four 3-color light signal units, three 2-color light signal units, six cross protection relays, 55 relays and other material.

## Supply Trade

The Allen-Bradley Company, Milwaukee, Wis., has moved its Chicago office to 500 North Dearborn street.

The W. C. West Company, Chicago, has moved its offices from 14 East Jackson boulevard to 435 North Michigan avenue.

The E. A. Lundy Company, Pittsburgh, Pa., has moved its Chicago office from 140 South Dearborn street to 80 East Jackson boulevard.

The Economy Railway Appliance Company, Limited, will move its offices on May 1, from the McGill building, to the Railway Exchange building, 321 Craig Street West, Montreal, Que.

The office of the American Railway Products Company, Inc., was removed on April 28, from 2710 Grand Central Terminal, New York City, to 74 Washington street, South Norwalk, Conn. George T. Cooke is president.

The Trico Fuse Manufacturing Co., Milwaukee, Wis., has removed its Pittsburgh office to new and larger quarters at 405 Penn avenue, Pittsburgh, Pa. Wm. A. Bittner is in charge of this office.

Edgar S. Ross, senior fellow of the Mellon Institute of Industrial Research, Pittsburgh, Pa., has resigned to become manager of research and development of the Headley Good Roads Company, Philadelphia.

A. L. Van Horn, assistant superintendent, United States Railway Mail Service in charge of postal car construction, has resigned to become a representative of the Wood Conversion Company, with headquarters at Washington, D. C.

W. H. Post representative of the Timken Roller Bearing Service and Sales Company with headquarters at Cleveland, Ohio has been promoted to manager of the Pittsburgh, Pa., branch office.

The Wagner Electric Corporation has moved its New York City branch sales office from 50 Church street to 30 Church street. The New York City service station remains at 321 West Fifty-fourth street.

Nelson G. Craig, has been appointed district manager at Philadelphia, Pa., with office at 1420 Walnut street of the Oliver Iron & Steel Corporation, Pittsburgh. Mr. Craig will have charge of the bolt, nut, rivet, and pole line material sales in the Philadelphia territory.

L. F. Gartner has been appointed general agent of the Western Pacific at Cincinnati, Ohio. G. L. McNay has been appointed general agent at Cleveland, Ohio and Fred McMullin has been appointed general agent at St. Louis, Mo.

The W. N. Matthews Corporation, St. Louis, Mo., has moved its Chicago office to 9 South Clinton street. E. B. Josler, formerly of the Central States General Electric Supply Company, has been appointed representative with headquarters in Chicago.

The Gunite Corporation, Rockford, Ill., has been incorporated to manufacture and market Gunite, a gun iron alloy which has heretofore been made in the Gunite division of the Rockford Malleable Iron Works. Duncan P. Forbes is president, and John A. Forbes, secretary.

Kenneth Grant, formerly of the Machinists Supply Company, Chicago, has been appointed representative of the Foote Brothers Gear & Machine Company, with headquarters in Chicago and will cover the territory in southern Wisconsin, northern Illinois and eastern Iowa, as far west as Des Moines.

Marcus Chase, sales manager of the Niles-Bement-Pond Company of Massachusetts, has resigned. Mr. Chase is leaving active service after 29 years of continuous service with the company, the last 17 of which he was manager of the Boston office. He is succeeded by M. S. Bradley, who has been an assistant to Mr. Chase for nearly 15 years.

The Southern Signal Corporation, Louisville, Ky., has opened an office at 214 Harrison building, Philadelphia, Pa., in charge of P. M. Etters who will handle all signal work in the Philadelphia and Baltimore territories. Another office has been opened at 136 Liberty street, New York City in charge of T. L. Mount who will handle the New York and New England territories.

The Safety Car Heating & Lighting Company, has removed its Canadian

West, to 10 Cathcart street, Montreal.

The Clark Car Company has moved its general office to 1310 Clark building, Pittsburgh, Pa. The New York City office has been moved from 52 Vanderbilt avenue to 30 Church street.

Hugh K. Christie, has been appointed a special salesman in the railroad department of the Whiting Corporation, Harvey, Ill. He entered the employ of the Pere Marquette as a machinist in the Saginaw shops and later held the position of air brake foreman, general locomotive foreman and air brake supervisor and instructor. For the past nine years he has specialized in railway shop training as editor, magazine and textbook writer and educator.

The National Lumber Manufacturers Association has established an informational and technical service for users of lumber and wood in other forms. This service is rendered to those having construction, manufacturing or utilization problems, and is supplied generally through bulletins containing results of various research activities. Thirty consultant engineers and specialists have been retained by the association for this service. They are located in groups available to every section of the coun-

try and are prepared to handle problems related to construction, architecture, engineering, agricultural and industrial uses, forestry, merchandising, wood technology and lumber grades.

**The Columbus McKinnon Chain Company**, Tonawanda, N. Y., has acquired control of the Hoist division of the **Chisholm-Moore Manufacturing Company**, Cleveland, Ohio. The general sales offices and factory will continue to operate in Cleveland, Ohio, under the same name as in the past. **S. H. Moore**, president of the Chisholm-Moore Manufacturing Company, who has been active with the company for the past 30 years, will continue with the organization and the personnel as a whole will remain the same.

The office of the **J. S. Coffin Jr., Company** on May 1, will be removed from the Trust Company building, Journal Square, Jersey City, to 36 Grand avenue, Englewood, N. J.

The Chicago office of the **Reading Iron Company**, Reading, Pa., after May 1, will be located at 205 West Wacker Drive, instead of 449 Conway building, Chicago. This office is under the direction of **R. A. Griffin**, district sales representative.

**Webb G. Krauser**, representing the Union Draft Gear Company and the Universal Draft Gear Attachment Company, has removed his office from 120 St. James street to 360 St. James street, Montreal, Que.

Stockholders of the **American Brake Shoe & Foundry Company** at a recent meeting of the board, approved the purchase of a controlling interest in the **National Bearing Metals Corporation**. The preferred stock of the latter company is to be acquired for cash, and the common stock will be taken in exchange for American Brake Shoe & Foundry Company stock. The American Brake Shoe & Foundry Company plans to obtain 30,000 shares of National Bearing Metals Corporation common on the basis of three shares of American Brake Shoe & Foundry Company common for four of National Bearing Metals Corporation. This, with a small lot of stock already owned, will give American Brake Shoe & Foundry Company control of the corporation, which has 60,000 common shares.

**Thomas J. Bray**, president of the **Republic Iron & Steel Company**, Youngstown, Ohio, has resigned, effective May 1. He was born in Pittsburgh, Pa., on May 1, 1867, and after receiving a public school education, entered the employ of the **Lewis Foundry & Machine Company**, Pittsburgh, as an apprentice in pattern making, which position he held for three years or until 1886. During the next four years he became chief draftsman of this company and was also identified with the **Riverside Iron Works**, Benwood, W. Va., (now the **Riverside works** of the **National Tube Company**). In 1890 he resigned to enter

**Lehigh University** from which he graduated with the degree of mechanical engineer in 1894. He then entered the employ of the **Ohio Steel Company** at Youngstown, and a few years later became associated with **McGill & Company**, Pittsburgh. He was secretary and mechanical engineer in 1901 when it became part of the **United Engineering & Foundry Company**. He remained with the latter company as chief engineer for the next five years when he resigned to become assistant to the president of the **Republic Iron & Steel Company**. Later he was appointed vice-president in charge of operations and in April, 1911 was elected president, which position he has held until his resignation.

**Harold L. Hughes**, who has been appointed assistant to the president of the **United States Steel Corporation** at New York, was born on November 2, 1879, at Saugus, Mass. Mr. Hughes was graduated from **Harvard University** in 1900. The following year he went with the **Carnegie Steel Company** at Pittsburgh, Pa., as a draftsman in the structural department. In 1903 he entered the service of the **United States Steel Products**



Harold L. Hughes

**Company**, New York, in the sales department. He subsequently served in the Montreal office of the same company and from 1907 to 1912 was manager of sales, at Sydney, Australia. Since 1917, Mr. Hughes has served in the executive offices of the **United States Steel Corporation** at New York and now becomes assistant to the president.

**William A. Forbes**, who has been appointed assistant to the president of the **United States Steel Corporation**, New York, was born at Stockton-on-Tees, England, October 26, 1876. He entered the employment of **Park Brothers**, Pittsburgh, in the chemical laboratory, in 1895 and later in that year went to the **Carnegie Steel Company**, Homestead, Pa., in its chemical laboratory, remaining there until 1900. He was employed by the **National Tube Company**, McKeesport, Pa., as assistant chemist, chief chemist and assistant superintendent of the blast furnaces, and at **McKeesport** and **Joliet, Ill.**, in studies of by-product coke oven developments. Since July, 1908, he has had charge of

the sale of all coke by-products of the **United States Steel Corporation's** sub-



William A. Forbes

sidaries and has specialized also in technological studies.

**Eugene Peoples Thomas**, who has been appointed a vice-president of the **United States Steel Corporation**, was born at Atlanta, Ga., in 1876. Mr. Thomas was graduated from the **Atlanta High School**, and started to work with the **Johnson Company**, (now the **Lorain Steel Company**) in Atlanta, in 1892, and represented this company at London, England, from 1899 to 1903. On the formation of the **United States Steel**



Eugene P. Thomas

**Products Company** in 1903, he became departmental manager in New York. In 1906 he became assistant to president, and in 1911 succeeded **James A. Farrell** as president of the **United States Steel Products Company**. Mr. Thomas now becomes a vice-president of the **United States Steel Corporation**, effective June 1. During the war, he was decorated as **Chevalier de la Legion d'honneur** by France, and **Cavaliere Ufficiale** of the **Order of the Crown of Italy**.

**I. Lamont Hughes** who has been appointed vice-president at New York of the **United States Steel Corporation**, was born in Mercer, Mercer County, Pa. He attended the common schools and was graduated from **North Braddock, Pa.**, high school. Mr. Hughes began work in the engineering department of the



Edgar Thomson Works of the Carnegie Steel Company in September, 1897. He took charge of engineering for the Union Steel Company, which is now a part of the American Steel & Wire Company, in June, 1901, and went to Youngstown in January, 1905, as master mechanic of the bar mills of the Youngstown district, Carnegie Steel Company. He was appointed assistant general superintendent of the bar mills of the Youngstown district of the Carnegie Steel Company in March, 1906, and five years later became general superintendent of these mills. In January, 1916, he was appointed assistant general superintendent of the Youngstown district of the Carnegie Steel Company. The following June, he



I. Lamont Hughes

went to Ojibway, Ontario, Canada, as general superintendent in charge of the Canadian Steel Company's project at that point; the contemplated work being held up by the war, he was transferred in June, 1918, to the Neville Island Gun Plant, at Neville Island, Pa., as general superintendent and, on the closing of this plant at the end of the war, he was transferred to the river department of the Carnegie Steel Company. In May, 1919, Mr. Hughes became president of the Lorain Steel Company, at Johnstown, Pa. He was transferred to the Youngstown district of the Carnegie Steel Company in January, 1920, as general superintendent. Mr. Hughes was elected vice-president of the Carnegie Steel Company in charge of operations and appropriations of the Western district plants on January 1, 1925. He now becomes vice-president of the United States Steel Corporation.

## Obituary

**Williams Robert Quinn**, designer of fuel oil burning equipment, died suddenly at New York, on April 12. Mr. Quinn was for several years past, representative at San Francisco for the Combustion Engineering Corporation.

**ARMCO INGOT IRON.**—In a newly published booklet of 41 pages, the American Rolling Mill Co., Middletown, O., presents in an interesting and instructive manner, the complete story of Armco, dealing with the origin and growth of the company, its policies and practices, and the development, method of manufacture, and uses of Armco ingot iron.

## Construction

**BALTIMORE & OHIO.**—A contract for the construction of a 300-ton, three-track reinforced concrete automatic electric coaling station, a 150-ton reinforced concrete gravity sand drying plant and a four-track multiple pit cinder handling plant at the Rossford terminal at Toledo, O., has been let to Roberts & Schaefer Co., Chicago.

**BALTIMORE & OHIO.**—This road has let a contract to Roberts & Schaefer Co., pany of Cumberland, Me., for grading on its line at Maplewood, O., at a cost of \$25,000.

**BALTIMORE & OHIO.**—This road has let a contract to Roberts & Schaeffer Co., Chicago, for the construction of a coaling station and ash handling facilities at Toledo, O., at a cost of \$40,000. The Joseph F. McCabe Company, Baltimore, Md., has been awarded a contract for masonry for a bridge at Stewart, W. Va., at a cost of \$31,000.

**CHICAGO, INDIANAPOLIS & LOUISVILLE.**—A contract for the construction of a 500-ton reinforced concrete automatic electric coaling station at Lafayette, Ind., has been let to Fairbanks, Morse & Co., Chicago. A contract has been awarded to the E. B. Styles Contracting Corporation, Chicago, for the construction of the concrete abutments for a steel span over a highway at Cedar Lake, Ind.

**DETROIT, GRAND HAVEN & MILWAUKEE.** This company will receive bids until noon, May 11, for grading approximately nine miles of double track railway extending north from Royal Oak, Mich.

**ERIE.**—Construction plans of this road are reported on page 984 of this issue.

**FLORIDA EAST COAST.**—The Interstate Commerce Commission has granted an extension of time to January 1, 1930, for the completion of construction work on this company's lines in Florida which were authorized in a certificate issued by the commission on January 10, 1923, conditioned on the work being completed by January 1, 1928.

**GREAT NORTHERN.**—This company has awarded a contract to W. T. Butler, Seattle, Wash., for the construction of a brick and steel shop at Wenatchee, Wash., for the repair of electric locomotives. The building will have outside dimensions of 82 ft. by 192 ft. and will be 50 ft. high. A contract has been let to Carl Steen, Grand Forks, N. D., for the construction of an extension to the roundhouse at Grand Forks.

**GULF, COLORADO & SANTA FE.**—A contract for the construction of a one-story reinforced concrete and steel machine shop at Cleburne, Tex., has been let to H. D. McCoy, Cleburne. The building will have outside dimensions of 202 ft. by 515 ft.

**ILLINOIS CENTRAL.**—A contract has been let to Estes Williams, Memphis, Tenn., for

the construction of a warehouse at Memphis which is to be used by the Cudahy Packing Company.

**KANSAS CITY SOUTHERN.**—Plans have been prepared by this company for the construction of a line between Leeds, Mo., and Grandview, 13 miles. At the present time the Kansas City Southern reaches Kansas City over the tracks of another company under a trackage agreement and a construction of this new line will provide an entrance into this city over its own rails. It is planned to construct the line with a .5 per cent compensated maximum grade corresponding with the balance of the first operating district out of Kansas City and permitting operating economies not now possible on the heavy grade of the present entrance into Kansas City. The cost of the project is estimated at \$3,000,000. It is planned to receive bids for all of the work except that of track laying and ballasting about June 15.

**LOS ANGELES & SALT LAKE.**—The budget of this company for 1928 calls for the construction of new bridges over the San Gabriel river and the Rio Hondo in California at a total cost of about \$400,000. The bridge over the San Gabriel river will be constructed one-half mile east of Montebello and that over the Rio Hondo will be constructed one-half mile east of Pico. It is also planned to improve an industrial area owned by this company in the vicinity of Los Angeles, Cal., by the construction of concrete roads, sanitary and storm sewers and public utility facilities.

**OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.**—Plans have been prepared by this company for the construction of additional storage tracks at Albina, near Portland, Ore., which, with the cost of land, will involve an expenditure of \$106,000. Between Meacham, Ore., and Huron it is planned to spend \$157,000 for the widening of cuts and the restoration of embankments. Work on this seven-mile stretch of line will mark the completion of a five-year program of improvements on the line between Pendleton, Ore., and Huntington, 174 miles.

**PENNSYLVANIA.**—This road has awarded a contract to the Blaw-Knox Company, Pittsburgh, Pa., for the erection of an engine house at Little Creek, Norfolk, Va. A contract has also been let to the John F. Casey Company, Pittsburgh, Pa., for the construction of an undergrade bridge to eliminate two grade crossings at Grapeville, Pa., at a cost of \$75,000. H. F. Curtis, Philadelphia, Pa., has been awarded a contract for grading, masonry, paving, curbing and track laying in connection with the new freight station at Trenton, N. J. This project is estimated at a cost of \$500,000.

**SOUTHERN PACIFIC.**—In a recent statement regarding improvements planned by this company at San Francisco, Cal., Henry W. de Forest, chairman of the board, announced that a preliminary investigation was under way looking toward the possible construction of a bridge across Carquinez Straits to replace the ferry boats now in use at that point. Mr. de Forest stated that the Southern

Pacific was not interested in any franchise or any project or plan to construct a bridge across San Francisco Bay.

**ST. LOUIS SOUTHWESTERN.**—This company will open bids on May 7 for the reconstruction of its line between Mt. Pleasant, Tex., and Tyler, 67 miles. This project involves the revision of grades and alignment at a cost which is estimated at \$1,900,000.

**TEXAS-NEW MEXICO.**—The Interstate Commerce Commission has made public a proposed report by Examiner M. S. Jameson recommending that the commission deny this company's application for authority to build a line from Monahans, Tex., to the Texas-New Mexico boundary line, about 35 miles. The examiner says that "profitable operation, even accepting the applicant's forecast of tonnage, may be seriously questioned, especially in view of the applicant's dependence on short line arbitrariness."

**UNION PACIFIC.**—The improvements planned for the terminal facilities at Gering, Neb., will include, in addition to the new passenger station, the construction of new team tracks, a five-stall enginehouse, a machine shop, a power house, and a coaling station and cinder-handling plant. The total cost of the projected construction at Gering will be about \$331,000. The plans for the construction of a one-story passenger station at Marysville, Kan., provide for the expenditure of about \$135,000 for a building which will have outside dimensions of 166 ft. by 38 ft. This station will be constructed of brick and terra cotta.

**VIRGINIAN.**—This road has let a contract to Haley, Chisholm & Morris, Charlottesville, Va., for extending passing tracks, at Harper, Lively, Oak Hill Junction, Hamilton and Page, W. Va., at a cost of \$75,000.

**WESTERN PACIFIC.**—The Interstate Commerce Commission has made public a proposed report by Examiner Sullivan recommending that a certificate be issued authorizing this company to construct an extension of its line at Wells, Nev., about 6,200 feet, to connect with a branch line of the Oregon Short Line. Protest against the issuance of the certificate asked was made by the Southern Pacific and the Central Pacific.

**YANKTON, NORFOLK & SOUTHERN.**—This company plans, contingent upon the approval of its incorporation by the State of South Dakota, the construction of a railroad between Yankton, S. D., and Norfolk, Neb., about 66 miles, at a cost of \$1,250,000. It is planned to utilize an abandoned right of way and a completed subgrade between Yankton and Pierce, Neb., 42 miles, and cross the Missouri river just south of Yankton on the state bridge. The line would connect with the Chicago & North Western at Crofton, Neb., Pierce and Norfolk, with the North Western, the Chicago, Milwaukee, St. Paul & Pacific and the Great Northern at Yankton, with the Chicago, Burlington & Quincy at Osmond, Neb., and with the Union Pacific at Norfolk.

## Financial

**ATCHISON, TOPEKA & SANTA FE.—Acquisition of Construction Company.**—This company and the Panhandle & Santa Fe have filed a joint application with the Interstate Commerce Commission for authority to acquire control of the Clinton & Oklahoma Western and the Clinton-Oklahoma Western of Texas by purchase of stock by the Santa Fe and by lease to the Panhandle company. The two companies have been authorized by the commission to build a line from Cheyenne, Okla., to Pampa, Tex., 85 miles. The Texas company also applied for authority to issue \$100,000 of stock to be purchased by the Santa Fe.

**ATCHISON, TOPEKA & SANTA FE.—Grand Canyon Hotels Valued as Carrier Property.**—The Interstate Commerce Commission has issued a supplemental report in the valuation case under reconsideration, modifying its former report so as to include as common-carrier property owned and used by the Grand Canyon Railway \$337,478 for the El Tovar and Bright Angel hotels and facilities appurtenant thereto at Grand Canyon, Ariz. This increases the final value for rate-making purposes of the Grand Canyon Railway to \$1,458,000 and that of the Santa Fe system to \$580,613,098. The commission has held that hotels in general are not necessary to the operation of a railroad but it now holds that in this case people go for a stop-over visit to the canyon, and not to reside at the hotels or to enjoy the climate.

**BESSEMER & LAKE ERIE.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$3,183,597 as compared with \$5,759,259 in 1926. Selected items from the income statement follow:

BESSEMER & LAKE ERIE	1927	1926
Average mileage operated .....	227.87	228.03
RAILWAY OPERATING REVENUES .....	\$13,410,859	\$16,972,124
Maintenance of way .....	1,390,823	1,189,216
Maintenance of equipment .....	3,880,055	3,919,134
Transportation .....	3,806,098	4,131,058
TOTAL OPERATING EXPENSES .....	9,612,143	9,867,893
NET REVENUE FROM OPERATIONS .....	3,798,716	7,104,231
Railway tax accruals .....	615,743	1,338,202
Railway operating income .....	3,181,987	5,764,880
Hire of freight cars, cr. ....	282,073	456,036
Joint facility rents, cr. ....	31,469	38,178
NET RAILWAY OPERATING INCOME .....	Not shown	865,019
Non-operating income .....	822,684	5,967
GROSS INCOME .....	4,004,671	6,629,899
Rent for leased roads .....	5,967	5,967
Interest on funded debt .....	753,787	795,688
TOTAL DEDUCTIONS FROM GROSS INCOME .....	821,074	870,640
NET INCOME .....	3,183,597	5,759,259

Disposition of net income  
Dividend appropriations of income ... 419,976 419,976

Income balance transferred to profit and loss ..... 2,763,621 | 5,339,283 |

**BUFFALO & SUSQUEHANNA.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$145,483 equivalent to \$3.63 per share earned on the \$4,000,000 of 4 per cent preferred stock. Net income in 1926 was \$124,322, or \$3.10 per share. Selected items from the income statement follow:

BUFFALO & SUSQUEHANNA	1927	1926
RAILWAY OPERATING REVENUES .....	\$1,530,183	\$1,307,499
Maintenance of way .....	331,565	326,584
Maintenance of equipment .....	598,748	494,876
Transportation .....	507,411	444,660
TOTAL OPERATING EXPENSES .....	1,553,186	1,386,305
NET REVENUE FROM OPERATIONS (DEF.) ....	23,002	78,805
Railway tax accruals .....	12,256	26,130
Railway operating income (def.) .....	35,262	105,020
Hire of freight cars, cr. ....	223,523	181,346
Joint facility rents, dr. ....	26,942	26,747
NET RAILWAY OPERATING INCOME .....	Not shown	460,220
Non-operating income .....	401,545	460,220
GROSS INCOME .....	366,282	355,200
Interest on funded debt .....	182,964	188,833
TOTAL DEDUCTIONS FROM GROSS INCOME .....	220,799	230,878
NET INCOME .....	145,483	124,322

**CHICAGO & EASTERN ILLINOIS.—New Director Elected.**—M. E. Singleton, president of the Utah Idaho Central Railroad at St. Louis, Mo., has been elected a director to succeed Frank D. Stout, deceased.

**CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—Annual Report.**—The annual report of this company is summarized on adjacent advertising pages.

**CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—New Director Elected.**—Walter W. Head, president of the Omaha National Bank, Omaha, Neb., has been elected a director to succeed Marvin Hughitt, Jr., who has resigned.

**CHICAGO & NORTH WESTERN.—Annual Report.**—The annual report of this company is summarized in advertising pages adjacent hereto.

**DENVER & RIO GRANDE WESTERN.—Bonds.**—The Interstate Commerce Commission has authorized this company to issue \$17,000,000 of refunding and improvement mortgage 5 per cent gold bonds, series B, \$12,000,000 of these bonds to be sold at 93½ and the remainder pledged and repledged for short term notes.

**DULUTH, SOUTH SHORE & ATLANTIC.—Abandonment.**—The Interstate Commerce Commission has authorized this company to abandon a branch extending from Humboldt, Mich., to Republic, 8.7 miles.

**ERIE.—Annual Report.**—The annual report for 1927 shows net income after in-



terest and other charges of \$3,512,650 equivalent after allowance for the 4 per cent dividends on the first and second preferred stocks to \$0.63 per share on the outstanding 1,511,167 shares of common stock. Net income in 1926 was \$10,113,393, or \$6.71 per share. Selected items from the income statement follow:

	1927	1926
Average mileage operated .....	2,316.81	2,317.26
RAILWAY OPERATING REVENUES .....	\$122,478,355	\$125,473,504
Maintenance of way .....	16,104,896	14,202,444
Maintenance of equipment .....	28,647,904	30,212,436
Transportation .....	48,737,266	48,249,922
TOTAL OPERATING EXPENSES .....	100,264,697	99,173,496
NET REVENUE FROM OPERATIONS .....	22,213,658	26,300,008
Railway tax accruals .....	4,821,270	4,868,271
Railway operating income .....	17,359,776	21,386,470
Hire of freight cars, dr. ....	4,615,813	3,670,383
Joint facility rents, dr. ....	119,851	43,572
NET RAILWAY OPERATING INCOME .....	12,960,700	18,052,723
Non-operating income .....	5,500,888	6,874,648
GROSS INCOME .....	18,461,588	24,927,371
Rent for leased roads .....	2,392,695	2,425,131
Interest on funded debt .....	11,237,924	10,781,715
TOTAL DEDUCTIONS FROM GROSS INCOME .....	14,948,938	14,813,977
NET INCOME .....	3,512,650	10,113,393
Balance for year transferred to credit of profit and loss .....	2,133,763	8,744,493

**FAIRPORT, PAINESVILLE & EASTERN.—Debentures.**—The Interstate Commerce Commission has authorized this company to issue \$300,000 of 10-year 6 per cent debentures to be sold at not less than par and accrued interest; reimbursement for heretofore uncanceled additions and betterments.

**INTERNATIONAL-GREAT NORTHERN.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$33,950. Net income in 1926 was \$684,650. Selected items from the income statement follow:

	1927	1926
Average mileage operated .....	1,159.50	1,159.50
RAILWAY OPERATING REVENUES .....	\$18,428,470	\$19,245,644
Maintenance of way .....	3,266,301	3,404,365
Maintenance of equipment .....	3,273,793	3,330,133
Transportation .....	7,356,863	7,303,051
TOTAL OPERATING EXPENSES .....	14,954,672	15,074,442
Operating ratio .....	81.15	78.33
NET REVENUE FROM OPERATIONS .....	3,473,798	4,171,202
Railway tax accruals .....	496,515	543,291
Railway operating income .....	2,970,535	3,621,730
Hire of freight cars, dr. ....	575,047	874,188
Joint facility rents, dr. ....	92,811	120,540
NET RAILWAY OPERATING INCOME .....	2,177,822	2,554,798
Non-operating income .....	74,371	111,554
GROSS INCOME .....	2,252,193	2,666,352
Interest on funded debt .....	2,135,422	1,962,706

TOTAL DEDUCTIONS FROM GROSS INCOME .....	2,218,243	1,981,702
NET INCOME .....	33,950	684,650

**KANSAS CITY, FORT SCOTT & MEMPHIS.—Securities.**—The Interstate Commerce Commission has authorized this company to issue \$20,496,500 of refunding mortgage bonds and \$13,736,000 of promissory notes. The bond issue will reimburse the applicant for expenditure in the purchase of securities of other Frisco subsidiaries. The note issue will provide funds to meet a maturity and will be secured by the bond issue. A decision is deferred on the application to deliver this bond issue to the trustee of the Frisco's consolidated mortgage, against which the Frisco proposes to issue an equal amount of its consolidated mortgage bonds, reimbursing itself thereby for advances made to the K. C. F. S. & M.

**LOUISIANA & ARKANSAS.—Note.**—The Interstate Commerce Commission has granted authority to this company to renew from time to time its promissory note for \$2,600,000 which matures May 1.

**LOUISVILLE & NASHVILLE.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$16,726,241 equivalent to \$14.29 per share on the outstanding 1,170,000 shares of capital stock. Net income in 1926 was \$19,422,111, or \$16.60 per share. Selected items from the income statement follow:

	1927	1926
Average mileage operated .....	5,064.63	5,038.21
RAILWAY OPERATING REVENUES .....	\$144,605,117	\$147,136,530
Maintenance of way .....	22,147,439	21,715,672
Maintenance of equipment .....	32,443,885	33,029,477
Transportation .....	50,531,905	50,658,351
TOTAL OPERATING EXPENSES .....	112,857,835	112,462,391
Operating ratio .....	78.05	76.43
NET REVENUE FROM OPERATIONS .....	31,747,283	34,674,140
Railway tax accruals .....	7,639,855	7,927,642
Railway operating income .....	24,087,731	26,722,760
Equipment rents, net cr. ....	178,041	812,459
Joint facility rents, net dr. ....	388,938	495,900
NET RAILWAY OPERATING INCOME .....	23,876,834	27,039,319
Non-operating income .....	4,075,052	3,783,224
GROSS INCOME .....	29,134,445	30,822,543
Interest on funded debt .....	10,893,095	11,023,086
TOTAL DEDUCTIONS FROM GROSS INCOME .....	11,225,645	11,400,432
NET INCOME .....	16,726,241	19,422,111

**MARYLAND & DELAWARE COAST.—Securities.**—The Interstate Commerce Commission has authorized this company to issue and reissue from time within a period of 2 years from April 1 not more than \$38,300 of promissory notes, pledging and pledging therefor \$102,600 first mortgage bonds.

**MINNEAPOLIS & ST. LOUIS.—Receiver's Certificates.**—The Interstate Commerce

Commission has authorized the receiver to issue \$1,475,000 receiver's certificates to extend or renew previous certificates maturing.

**MISSOURI PACIFIC.—Annual Report.**—The annual report of this company is summarized on advertising pages adjacent hereto.

**MISSOURI-KANSAS-TEXAS.—Answer to I. C. C. Complaint.**—This company has filed with the Interstate Commerce Commission an answer to the commission's complaint charging violation of the Clayton law in connection with this company's agreement to purchase stock of the St. Louis Southwestern from the Kansas City Southern, asking that the commission dismiss the complaint on the ground that no violation of the law is involved. The answer states that it appears on the face of the complaint that it did not acquire directly or indirectly any of the stock of the Cotton Belt, although it admits that it made a payment toward the stock under an agreement which was made contingent upon the approval of the commission, and it denies that it has exercised any of the rights of ownership.

**MOBILE & OHIO.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$1,349,667 equivalent to \$22.43 per share on the outstanding 60,168 shares of stock. Net income in 1926 was \$1,886,339, or \$31.35 per share. Selected items from the income statement follow:

	1927	1926
Average mileage operated .....	1,161.33	1,161.33
RAILWAY OPERATING REVENUES .....	\$18,055,294	\$19,342,805
Maintenance of way .....	2,676,027	2,858,604
Maintenance of equipment .....	3,149,553	3,503,595
Transportation .....	6,594,777	6,645,210
TOTAL OPERATING EXPENSES .....	13,594,791	14,219,710
Operating ratio .....	75.30	73.51
NET REVENUE FROM OPERATIONS .....	4,460,503	5,123,095
Railway tax accruals .....	1,080,000	1,223,872
Equipment rents, dr. ...	160,805	194,436
Joint facility rents, dr. ....	284,568	292,592
NET RAILWAY OPERATING INCOME .....	2,931,071	3,404,766
Non-operating income .....	213,468	165,169
GROSS INCOME .....	3,144,539	3,569,935
Interest on funded debt .....	1,426,019	1,353,840
TOTAL DEDUCTIONS FROM GROSS INCOME .....	59,751	53,157
Total available income .....	3,084,788	3,516,777
Balance of income over charges .....	1,349,667	1,886,339
Dividends .....	722,016	601,680
Balance carried to credit of profit and loss ..	627,651	1,284,659

**NASHVILLE, CHATTANOOGA & ST. LOUIS.—Annual Report.**—The annual report for 1927 shows net income after interest and other charges of \$2,325,821 equivalent to \$14.53 per share earned on the outstanding 160,000 shares of stock. Net income in 1926 was \$2,511,258, or \$15.70 per share.

(Continued on page 1,001)

# Annual Reports

## Union Pacific System-Year Ended December 31, 1927

NEW YORK, N. Y., April 12, 1928.

TO THE STOCKHOLDERS OF UNION PACIFIC RAILROAD COMPANY:

The Board of Directors submits the following report of the operations and affairs of the Union Pacific Railroad Company for the calendar year ended December 31, 1927, including the Oregon Short Line Railroad Company, whose entire Capital Stock is owned by the Union Pacific Railroad Company, the Oregon-Washington Railroad & Navigation Company, whose entire Capital Stock (except fifteen qualifying shares held by Directors) is owned by the Oregon Short Line Railroad Company, and the Los Angeles & Salt Lake Railroad Company, whose entire Capital Stock is owned, one half each, by the Union Pacific Railroad Company and the Oregon Short Line Railroad Company. For convenience, the four companies are designated by the term "UNION PACIFIC SYSTEM."

### Income

The operated mileage at close of year and income for the calendar year 1927, compared with 1926, after excluding all offsetting accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Company, were as follows:

Operated Mileage at Close of Year.	
Miles of road .....	9,676.81
Miles of additional main track.....	1,526.31
Miles of yard tracks and sidings.....	3,842.05
Total Mileage Operated .....	15,045.17
INCOME.	
Operating Revenues .....	\$203,891,622.46
Operating Expenses .....	140,334,442.20
Revenues over Expenses .....	\$63,557,180.26
Taxes .....	15,985,844.32
Uncollectible Railway Revenues .....	17,073.98
Railway Operating Income .....	\$47,554,261.96
Rents from use of joint tracks, yards, and terminal facilities.....	1,667,282.32
Hire of equipment—debit balance, and rents for use of joint tracks, yards, and terminal facilities .....	\$49,221,544.28
Net Income from Transportation Operations.....	9,738,154.02
Income from Investments and sources other than transportation operations.,	8,177,927.11
Total Income .....	\$39,483,390.26
Deduct:	18,435,629.57
Fixed and Other Charges .....	\$57,919,019.83
Net Income from All Sources.....	\$59,229,806.61
DISPOSITION OF NET INCOME.	
Dividends on Preferred Stock of Union Pacific Railroad Company.....	\$3,981,740.00
Sinking Fund Requirements .....	5,676.64
Surplus for Common Stock of Union Pacific Railroad Company.....	\$3,981,740.00
Per Cent earned on \$222,291,600 par value.....	\$35,683,495.22
Dividends on Common Stock.....	16.05
Surplus, Transferred to Profit and Loss.....	22,229,160.00

The increase in "Income from Investments" of \$1,305,966.00 is due principally to increase in dividends on stocks owned.

While the decrease in "Freight Revenue" was only \$95,768.80 or .1%, there were substantial fluctuations in the movement of individual commodities. Unfavorable conditions in the lumber industry, with consequent curtailment of production by mills in the Pacific Northwest, resulted in a substantial decrease in the transportation of forest products. There was a substantial reduction also in the movement of manufactures, particularly automobiles and sugar, because of the general decline in output by automobile manufacturers and a short crop of sugar beets last year in Idaho and Utah. Crude petroleum and other petroleum oils were moved in less volume due to curtailed production of oil, principally in Kansas, and reduced operations of refineries in Wyoming. California grapes were of excellent quality and marketing conditions were favorable, resulting in a substantial increase in the movement of that fruit, but from States west of the Rocky Mountains there were decreases in shipments of other deciduous fruits and of potatoes, due principally to a light crop of pears, plums and apples and to a small hold-over from the 1926 potato crop and lessened demand for potatoes in the East. Good corn and wheat crops in Nebraska, greater yields of wheat in the Northwestern States and improved crops of oranges and grapefruit in California resulted in substantial increases in the

transportation of these commodities. There was a substantial increase also in the movement of coal due to colder weather than last year, and to the miners' strike in Colorado which resulted in increased long-haul shipments from Wyoming and Utah mines.

The decrease of \$1,221,658.12 or 4.1% in "Passenger Revenue" was due to a decrease of 5.3 per cent in revenue passengers carried one mile, caused principally by the continued diversion of local short-haul business to motor vehicles.

The decrease of \$146,600.99 or 3.6% in "Express Revenue" was due principally to a decrease in the movement by express of carload shipments of early fruits from Oregon and Washington because of a smaller crop this year.

The decrease of \$169,707.97 or 6% in "Maintenance of Way and Structures Expenses" was due to ordinary fluctuations in repairs and renewals and in care of roadbed.

The principal track materials used during the year in making renewals were as follows:

New steel rails .....	282.10 track miles
Second-hand steel rails .....	115.83 track miles
Total .....	397.93 track miles

Calendar Year 1927	Calendar Year 1926	Increase	Decrease
9,676.81	9,676.55	.26	
1,526.31	1,518.88	7.43	
3,842.05	3,800.54	41.51	
15,045.17	14,995.97	49.20	
\$203,891,622.46	\$205,416,263.52		\$1,524,641.06
140,334,442.20	140,769,540.31		435,098.11
\$63,557,180.26	\$64,646,723.21		\$1,089,542.95
15,985,844.32	15,725,933.06	\$259,911.26	
17,073.98	13,950.91	3,123.07	
\$47,554,261.96	\$48,906,839.24		\$1,352,577.28
1,667,282.32	1,371,230.91	\$296,051.41	
\$49,221,544.28	\$50,278,070.15		\$1,056,525.87
9,738,154.02	8,177,927.11	\$1,560,226.91	
\$39,483,390.26	\$42,100,143.04		\$2,616,752.78
18,435,629.57	17,129,663.57	\$1,305,966.00	
\$57,919,019.83	\$59,229,806.61		\$1,310,786.78
18,253,784.61	18,245,057.43	\$8,727.18	
\$39,665,235.22	\$40,984,749.18		\$1,319,513.96
\$3,981,740.00	\$3,981,740.00		
	5,676.64		\$5,676.64
\$3,981,740.00	\$3,987,416.64		\$5,676.64
\$35,683,495.22	\$36,997,332.54		\$1,313,837.32
16.05	16.05		.59
22,229,160.00	22,229,160.00		
\$13,454,335.22	\$14,768,172.54		\$1,313,837.32

excluding yard tracks and sidings, equivalent to 3.8 per cent of the track miles in main track at the beginning of the year. Ties, 2,797,799 (98.2 per cent treated), equivalent to 7.2 per cent of all ties in track at the beginning of the year. Tie plates 1,968,027 and continuous rail joints 157,075.

The decrease of \$616,781.38 or 1.6% in "Maintenance of Equipment Expenses" was due principally to a decrease in locomotive repairs because of improved shop practices and less maintenance being required due to improvements to locomotives and a small decrease in locomotive miles, partially offset by increased wage schedules. Locomotives were maintained in good condition.

The decrease of \$213,849.41 or .4% in "Transportation Expenses—Rail Line" was due principally to a reduction in prices and quantities of locomotive fuel consumed, partially offset by increase in wages, chiefly of switchmen.

The increase of \$327,271.01 or 4.5% in "General Expenses" was due principally to increases in wages of clerical forces, pension payments and valuation expenses.

The table shows analysis by classes of the increase of \$259,911.26 or 1.7% in "Taxes." The increase in State and county taxes was due to increased assessments on account of additional investment in road and equipment and increased tax levies in the several States. The decrease in Federal in-

[ADVERTISEMENT]



come tax resulted from decrease in taxable income. The decrease in Federal capital stock tax was due to the abolishment of this tax effective June 30, 1926.

The increase of \$926,295.66 or 15.4% in "Equipment Rents (Debit)" was due to an increase of 4.2 per cent in mileage payments on refrigerator and tank cars and a decrease of 10.1 per cent in per diem collections from foreign roads.

The increase of \$337,879.84 or 43.4% in "Joint Facility Rents (Debit)" was due principally to adjustments of rental payments for use of joint terminal facilities with other carriers.

Operating results for year 1927 compared with year 1926:

	Calendar Year 1927	Calendar Year 1926	Increase 30.59	Decrease	Per Cent.
Average miles of road operated .....	9,677.63	9,647.04			.3
<b>OPERATING REVENUES.</b>					
1. Freight revenue .....	\$157,745,245.71	\$157,841,014.51		\$95,768.80	.1
2. Passenger revenue .....	28,452,380.42	29,674,038.54		1,221,658.12	4.1
3. Mail revenue .....	4,343,021.79	4,431,818.86		88,797.07	2.0
4. Express revenue .....	3,981,604.43	4,128,205.42		146,600.99	3.6
5. Other passenger-train revenue .....	4,010,507.56	4,088,970.19		78,462.63	1.9
6. Other train revenue .....	85,588.75	67,912.24	\$17,676.51		26.0
7. Switching revenue .....	1,320,080.18	1,261,886.37	58,193.81		4.6
8. Water line revenue .....	66,828.17	55,371.64	11,456.53		20.7
9. Other revenue .....	3,886,365.45	3,867,045.75	19,319.70		.5
10. Total operating revenues .....	\$203,891,622.46	\$205,416,263.52		\$1,524,641.06	.7
<b>OPERATING EXPENSES.</b>					
11. Maintenance of way and structures .....	\$27,991,232.06	\$28,160,940.03		\$169,707.97	.6
12. Maintenance of equipment .....	37,393,403.04	38,010,184.42		616,781.38	1.6
13. Total maintenance expenses .....	\$65,384,635.10	\$66,171,124.45		\$786,489.35	1.2
14. Traffic expenses .....	4,579,355.41	4,529,212.43	\$50,142.98		1.1
15. Transportation expenses—rail line .....	58,373,993.60	58,587,843.01		213,849.41	.4
16. Transportation expenses—water line .....	58,560.47	50,349.38	8,211.09		16.3
17. Miscellaneous operations expenses .....	4,400,306.53	4,247,562.12	152,744.41		3.6
18. General expenses .....	7,560,762.02	7,233,491.01	327,271.01		4.5
19. Transportation for investment—Credit .....	23,170.93	50,042.09		26,871.16	53.7
20. Total operating expenses .....	\$140,334,442.20	\$140,769,540.31		\$435,098.11	.3
21. Revenues over expenses .....	\$63,557,180.26	\$64,646,723.21		\$1,089,542.95	1.7
<b>TAXES.</b>					
22. State and county .....	\$11,852,812.46	\$10,903,677.65	\$949,134.81		8.7
23. Federal capital stock .....		303,566.50		\$303,566.50	100.0
24. Federal income .....	4,133,018.14	4,514,978.51		381,960.37	8.5
25. All other federal .....	13.72	3,710.40		3,696.68	99.6
26. Total taxes .....	\$15,985,844.32	\$15,725,933.06	\$259,911.26		1.7
27. Uncollectible railway revenues .....	\$17,073.98	\$13,950.91	\$3,123.07		22.4
28. Railway operating income .....	\$47,554,261.96	\$48,906,839.24		\$1,352,577.28	2.8
29. Equipment rents (debit) .....	6,954,515.26	6,028,219.60	\$926,295.66		15.4
30. Joint facility rents (debit) .....	1,116,356.44	778,476.60	337,879.84		43.4
31. Net railway operating income .....	\$39,483,390.26	\$42,100,143.04		\$2,616,752.78	6.2
Per cent—Operating expenses of operating revenues .....	68.83	68.53	.30		.4
<b>FREIGHT TRAFFIC.</b>					
<i>(Commercial Freight only)</i>					
Tons of revenue freight carried .....	34,785,587	34,534,148	251,439		.7
Ton-miles, revenue freight .....	13,157,043,050	13,211,549,913		\$4,506,863	.4
Average distance handled per ton (miles) .....	378.23	382.56		4.33	1.1
Average revenue per ton-mile (cents) .....	1.181	1.178	.003		.3
Average revenue per freight-train mile .....	\$7.57	\$7.51	\$0.06		.8
<b>PASSENGER TRAFFIC.</b>					
<i>(Excluding Motor Car and Motor Coach)</i>					
Revenue passengers carried .....	3,494,825	4,004,975		510,150	12.7
Revenue passengers carried one mile .....	931,033,103	983,163,679		52,130,576	5.3
Average distance hauled per passenger (miles) .....	266.40	245.49	20.91		8.5
Average passengers per passenger-train mile .....	48.93	51.27		2.34	4.6
Average revenue per passenger-mile (cents) .....	2.991	2.982	.009		.3
Average revenue per passenger-train mile, passengers only .....	\$1.46	\$1.53		\$0.07	4.6
Average, total revenue per passenger-train mile .....	\$2.10	\$2.18		\$0.08	3.7

The increase in "Investment in Road and Equipment" is made up as follows:

Extensions and Branches .....	\$354,746.80
Additions and Betterments, excluding Equipment .....	9,622,575.73
Equipment, as detailed above .....	2,966,774.82

Total Increase .....

From which there was deducted:

Cost of property retired from service and not to be replaced .....	\$ 406,391.49
Cost of real estate retired .....	79,905.68
Cost of equipment retired from service .....	1,104,098.40

Total Deductions .....

Net increase in "Investment in Road and Equipment" .....

#### Additions and Betterments

The principal Additions and Betterments to the Properties during the year ended December 31, 1927, were as follows:

Station Buildings. Clarks, Nebraska: 21 x 71 foot tile and stucco combination freight and passenger depot. Yakima, Washington: 31 x 121 foot brick passenger depot with brick platform.

Hotels and Restaurants. West Yellowstone, Montana: 38 x 82 foot

addition to dormitory building for employees. Cedar Breaks, Utah: Four 2-room employees' cabins. Bryce Canyon, Utah: Five de luxe 2-room guest cabins and two small observation pavilions. Zion National Park, Utah: Five de luxe 2-room guest cabins, and dormitory for women, employees.

Water Stations. Ogallala, Nebraska; Riner, Wyoming, and Hillgrove, California: New wells, pumping facilities, etc. Salt Lake City, Utah, and Glenn's Ferry, Idaho: Water treating plants. Milford, Utah: 126,000 gallon steel tank on steel tower, air lift and pipe lines.

Shop Buildings and Engine Houses. Ogden, Utah: 20-stall brick enginehouse with 40 x 82 foot brick machine shop, 100-foot turntable, two

concrete cinder pits, electric traveling crane, power plant, etc., for new engine terminal facilities. Salt Lake City, Utah: Seven stalls in engine-house extended. Albina, Oregon: 125 x 400 foot open car repair shed. Los Angeles, California: Additional coach cleaning facilities.

Roadway Buildings. At various points, new section buildings provided for track forces and new dwelling houses for employees.

Railway Bridges. Bridge over Spring Creek near Schuyler, Nebraska: One 50-foot steel span for double track, replacing three I-beam concrete spans. Bridge over North Platte River near North Platte, Nebraska: Forty 50-foot steel spans on extended concrete piers and abutments of existing bridge to provide for second track. Bridge over drainage channel near Potter, Nebraska: Eight 20-foot steel spans on concrete piers and abutments for two tracks, replacing two pile trestles. Bridges over drainage ditch near Laramie, Wyoming: One 34-foot steel span for two main tracks and yard lead, and five pile trestles for side tracks. Bridge over Alum Creek near Carneiro, Kansas: One 62-foot steel span on concrete pier and abutments, replacing 60-foot span on pile piers and 9-span pile trestle approach. Bridge over Rattlesnake Creek near Peoria, Colorado: One 50-foot steel span on concrete abutment, replacing 6-span pile trestle approach; also concrete piers and abutments under existing structure, replacing pile piers. Bridge over Des Chutes River near Miller, Oregon: One 50-foot and six 76-foot deck plate girders on concrete piers to provide for second track. Bridge over San Jose Creek near Bartolo, California: One 24-foot and three 85-foot deck plate girders spans on concrete piers and abutments, replacing one 110-foot through riveted truss and two 60-foot through plate girder spans. Many minor bridges requiring renewal were replaced.

Tunnels. Tunnels Nos. 8 and 9 near Devil's Slide, Utah; Tunnel No. 12 near Eccles, Nevada, and Tunnel No. 18 near Brown, Nevada: Enlarged and lined with concrete.

[ADVERTISEMENT]

[Continued on page 994]

**Additional Main Tracks.** Between M.P. 274.093 and M.P. 275.439, Idaho, 1.34 miles, and between Dietrich and Shoshone, Idaho, 6.30 miles, total 7.64 miles, of Second Main Tracks completed and placed in operation during the year.

**Telegraph and Telephone Lines.** Between Nebraska-Wyoming State Line and Cheyenne, Wyoming; between Ellis and Oakley, Kansas, and between Limon and Denver, Colorado: 205 miles of telegraph lines reconstructed. Between Portland, Oregon, and Seattle, Washington: Additional telephone circuit. Telephone line was extended a distance of 113 miles from a connection with the Cedar City-Bryce Canyon line to serve facilities being constructed at Grand Canyon National Park.

**Signals and Interlocking Plants.** Omaha, Nebraska; Bonner Springs, Kansas, and East San Pedro, California: Electric interlocking plants. Between Crooks and Pyle, Oregon; between Sand, Oregon, and Wallula, Washington; between Gilmore and The Dalles, and Mosier and Rooster Rock, Oregon, and between Etna and Farrier, Nevada: Rock slide warning device consisting of wire fence panels electrically connected with automatic block signals. Between Lynndyl and Tomas, Utah, and between Farrier, Nevada, and Daggett, California: 395 miles of automatic block signals.

**Fuel Stations.** Ogden, Utah: 350-ton conveyor type steel coaling station for new engine terminal facilities.

**Elimination of Grade Crossings.** Los Angeles, California: Reinforced concrete viaduct and approaches at Seventh Street.

**Miscellaneous.** Omaha, Nebraska: Additional real estate purchased for future extension of Headquarters Building. Laramie, Wyoming; Pocatello, Idaho, and The Dalles, Oregon: Buildings and equipment for adzing, boring and incising ties in wood preserving plants. Between Meacham and Tunnel No. 4, and Huron and Minthorn, Oregon, and near Elgin, Vigo, and Galt Nevada: Cuts widened. Between Thorn Hollow and Cayuse, Oregon: Line change to eliminate curvature, utilizing material obtained from widening cuts in same region. At Albina, Oregon: Two 250 H.P. boilers with chain grate stokers, replacing six 120 H.P.

boilers, in power house. Spokane, Washington: 90 x 180 foot brick warehouse. Astoria and Megler, Washington: Ferryboat for handling freight, passenger and automobile business across Columbia River, with landing facilities at both points. Las Vegas, Nevada: 19 x 72 foot brick extension to power house, additional turbo-generator and condenser, cooling tower, and 1500 H.P. feed water heater. Various locations: 2 caterpillar dragline excavators purchased, and 89 new motor cars acquired for use of maintenance forces, replacing in most cases old motor cars and hand cars. Many industry tracks, yard tracks and sidings were constructed and, where necessary, rail was renewed with heavier rail and other improvements were made to roadway and track.

In August, 1927, construction was authorized of a cut-off line, approximately 54 miles, between Egbert, Wyoming, on the main line 32 miles east of Cheyenne, and Creighton, Wyoming, near the westerly end of the North Platte Branch, which will provide a shorter route from the west and south to points on the North Platte Branch, and also develop new territory in southern Wyoming, of which part is a rich agricultural region and the remainder well adapted to the raising of livestock.

Extensions of the Lyman Branch from Sears, Nebraska, southerly 3.44 miles and southeasterly 2.60 miles were constructed and opened for operation during the year. These lines were built for the purpose of developing additional territory for the growing of sugar beets.

During the year the Utah Parks Company, whose entire capital stock is owned by the Los Angeles & Salt Lake Railroad Company, made an agreement with the United States National Park Service for the operation of tourist facilities at Grand Canyon National Park and acquired the franchises

### General Balance Sheet—Assets

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

	December 31, 1927	December 31, 1926	Increase	Decrease
<b>Investments:</b>				
ROAD AND EQUIPMENT .....	\$885,182,950.60	\$873,669,437.46	\$11,513,513.14	.....
Less:				
Receipts from improvement and equipment fund .....	\$23,823,091.13	\$23,823,091.13	.....	.....
Appropriations from income and surplus prior to July 1, 1907, credited to this account .....	13,310,236.52	13,310,236.52	.....	.....
Total .....	\$37,133,327.65	\$37,133,327.65	.....	.....
701. Investment in road and equipment .....	\$848,049,622.95	\$836,536,109.81	\$11,513,513.14	.....
702. IMPROVEMENTS ON LEASED RAILWAY PROPERTY .....	\$21,520.37	\$19,019.12	\$2,501.25	.....
704. DEPOSITS IN LIEU OF MORTGAGED PROPERTY SOLD .....	216,249.21	342,430.78	.....	\$126,181.57
705. MISCELLANEOUS PHYSICAL PROPERTY .....	1,968,779.50	2,262,609.68	.....	293,830.18
Total .....	\$2,206,549.08	\$2,624,059.58	.....	\$417,510.50
706. Investments in affiliated companies:				
Stocks .....	\$20,495,548.46	\$20,483,584.46	\$11,964.00	.....
Bonds, notes, and equipment trust certificates .....	26,078,444.69	23,630,904.87	2,447,539.82	.....
Advances .....	9,186,119.02	9,023,246.45	162,872.57	.....
Total .....	\$55,760,112.17	\$53,137,735.78	\$2,622,376.39	.....
707. Investments in other companies:				
Stocks .....	\$93,904,166.63	\$89,891,599.93	\$4,012,566.70	.....
Bonds, notes, and equipment trust certificates .....	76,627,577.36	69,997,954.25	6,629,623.11	.....
Total .....	\$170,531,743.99	\$159,889,554.18	\$10,642,189.81	.....
UNITED STATES GOVERNMENT BONDS AND NOTES .....	\$32,013,361.56	\$31,999,543.75	\$13,817.81	.....
703. SINKING FUNDS .....	\$143,039.63	\$194,405.65	.....	\$51,366.02
Total Investments .....	\$1,108,704,429.38	\$1,084,381,408.75	\$24,323,020.63	.....
<b>Current Assets:</b>				
708. CASH .....	\$6,920,270.84	\$38,972,343.47	.....	\$32,052,072.63
709. DEMAND LOANS AND DEPOSITS .....	22,500,000.00	.....	\$22,500,000.00	.....
711. SPECIAL DEPOSITS .....	75,367.44	47,479.63	27,887.81	.....
712. LOANS AND BILLS RECEIVABLE .....	6,601,102.17	1,896.87	6,599,205.30	.....
713. TRAFFIC AND CAR SERVICE BALANCES RECEIVABLE .....	4,581,668.39	4,736,025.18	.....	154,356.79
714. NET BALANCE RECEIVABLE FROM AGENTS AND CONDUCTORS .....	1,184,377.22	1,125,914.24	58,462.98	.....
715. MISCELLANEOUS ACCOUNTS RECEIVABLE .....	4,181,303.04	4,464,115.52	.....	282,812.48
716. MATERIAL AND SUPPLIES .....	16,002,243.47	16,118,333.28	.....	116,089.81
717. INTEREST AND DIVIDENDS RECEIVABLE .....	1,803,201.07	1,663,749.82	139,451.25	.....
718. RENTS RECEIVABLE .....	167,068.76	163,860.96	3,207.80	.....
719. OTHER CURRENT ASSETS:				
Baltimore and Ohio Railroad Co. capital stock applicable to pay- ment of extra dividend of 1914 .....	131,702.20	138,746.20	.....	7,044.00
Miscellaneous items .....	51,332.00	202,475.01	.....	151,143.01
Total Current Assets .....	\$64,199,636.60	\$67,634,940.18	.....	\$3,435,303.58
<b>Deferred Assets:</b>				
720. WORKING FUND ADVANCES .....	\$67,643.09	\$54,664.06	\$12,979.03	.....
722. OTHER DEFERRED ASSETS:				
Land contracts, as per contra .....	62,378.08	82,692.97	.....	\$20,314.89
Miscellaneous items .....	3,758,629.44	4,007,684.34	.....	249,054.90
Total Deferred Assets .....	\$3,888,650.61	\$4,145,041.37	.....	\$256,390.76
<b>Unadjusted Debits:</b>				
723. RENTS AND INSURANCE PREMIUMS PAID IN ADVANCE .....	\$4,170.96	\$3,504.66	\$666.30	.....
725. DISCOUNT ON FUNDED DEBT .....	1,048,544.96	1,080,411.78	.....	\$31,866.82
727. OTHER UNADJUSTED DEBITS .....	1,268,762.60	1,163,799.94	104,962.66	.....
Total Unadjusted Debits .....	\$2,321,478.52	\$2,247,716.38	\$73,762.14	.....
<b>Grand Total .....</b>	<b>\$1,179,114,195.11</b>	<b>\$1,158,409,106.68</b>	<b>\$20,705,088.43</b>	<b>.....</b>

[ADVERTISEMENT]



and property of the Utah & Grand Canyon Transportation Company, which was operating motor coaches between Zion National Park and Bryce Canyon on the one hand, and Grand Canyon National Park on the other, thus extending its own motor coach operations, which were inaugurated in 1923 between Cedar City, Zion National Park, Cedar Breaks and Bryce Canyon, to the Grand Canyon and including in its five-day motor coach circle tour, reached by the Union Pacific through Cedar City, Utah, three National Parks, namely, Zion, Bryce Canyon and Grand Canyon, a National Park having been established by Congress at Bryce Canyon.

Construction was authorized of a central lodge and guest cabins at the Grand Canyon, capable of accommodating 294 guests, and of a hydro-electric plant which will assure an ample supply of water and electric current for power and light in the operation of the new facilities. Additional facilities for the accommodation of tourists were constructed at Bryce Canyon and Zion National Park. All of these improvements will be completed at the beginning of the tourist season, June 1, 1928.

An issue of \$26,835,000 face value debenture bonds, known as Union Pacific Railroad Company Forty Year Four and One Half Per Cent Gold Bonds, was made under an indenture dated July 1, 1927 and sold on that date for the purpose of retiring and refunding \$26,835,225 face value of Union Pacific Railroad Company Twenty Year Four Per Cent Convertible Bonds which matured on that date. These bonds mature on July 1, 1967 and bear interest at the rate of four and one half per cent per annum from July 1, 1927, payable semi-annually on January 1 and July 1 of each year. They are redeemable as a whole only, upon not less than sixty days' previous notice, on July 1, 1932, or any semi-annual interest date thereafter to and including July 1, 1962, at 102½ per cent of their principal amount, and on any semi-annual interest date thereafter at a premium equal to one quarter of one per cent of such principal amount for each six months between the date designated for redemption and the date of maturity, in either case with accrued interest to the date designated for redemption. The discount and expense incident to the sale of these bonds was charged to Profit and Loss.

### General Balance Sheet—Liabilities

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

	December 31, 1927	December 31, 1926	Increase	Decrease
<b>751. Capital Stock:</b>				
Common stock .....	\$222,293,100.00	\$222,293,100.00	.....	.....
Preferred stock .....	99,543,500.00	99,543,500.00	.....	.....
Total Capital Stock .....	\$321,836,600.00	\$321,836,600.00	.....	.....
<b>755. Funded Debt</b> .....	411,317,075.00	412,770,925.00	.....	\$1,453,850.00
Total .....	\$733,153,675.00	\$734,607,525.00	.....	\$1,453,850.00
<b>754. Grants in Aid of Construction</b> .....	\$395,596.73	\$379,809.26	↑ \$15,787.47	.....
<b>Current Liabilities:</b>				
<b>759. TRAFFIC AND CAR SERVICE BALANCES PAYABLE</b> .....	\$1,731,091.66	\$1,695,160.90	\$35,930.76	.....
<b>760. AUDITED ACCOUNTS AND WAGES PAYABLE</b> .....	11,850,172.26	10,900,860.05	949,312.21	.....
<b>761. MISCELLANEOUS ACCOUNTS PAYABLE:</b>				
Due to affiliated companies .....	12,884,974.17	9,876,159.43	3,008,814.74	.....
Other accounts payable .....	170,335.01	158,739.10	11,595.91	.....
<b>762. INTEREST MATURED UNPAID:</b>				
Coupons matured, but not presented .....	137,031.59	145,484.95	.....	\$8,453.36
Coupons, and interest on registered bonds, due first proximo....	5,116,439.00	5,049,435.30	67,003.70	.....
<b>763. DIVIDENDS MATURED UNPAID:</b>				
Dividends due but uncalled for .....	129,942.50	118,763.00	11,179.50	.....
Extra dividend on common stock declared January 8, 1914, payable to stockholders of record March 2, 1914, unpaid.....	141,819.63	148,973.65	.....	7,154.02
Dividend on common stock payable third proximo.....	5,557,290.00	5,557,290.00	.....	.....
<b>764. FUNDED DEBT MATURED UNPAID</b> .....	136,400.00	39,000.00	97,400.00	.....
<b>766. UNMATURED INTEREST ACCRUED</b> .....	1,668,114.16	1,683,888.39	.....	15,774.23
<b>767. UNMATURED RENTS ACCRUED</b> .....	482,164.70	506,724.82	.....	24,560.12
<b>768. OTHER CURRENT LIABILITIES</b> .....	153,152.41	145,480.64	7,671.77	.....
Total Current Liabilities .....	\$40,158,927.09	\$36,025,960.23	\$4,132,966.86	.....
<b>Deferred Liabilities:</b>				
<b>770. OTHER DEFERRED LIABILITIES:</b>				
Principal of deferred payments on land contracts, as per contra....	\$62,378.08	\$82,692.97	.....	\$20,314.89
Contracts for purchase of real estate .....	1,660,000.00	1,660,000.00	.....	.....
Miscellaneous items .....	7,903,882.93	7,700,437.52	\$203,445.41	.....
<b>771. TAX LIABILITY</b> .....	9,879,165.77	9,677,984.04	201,181.73	.....
Total Deferred Liabilities .....	\$19,505,426.78	\$19,121,114.53	\$384,312.25	.....
<b>Unadjusted Credits:</b>				
<b>773. INSURANCE RESERVE:</b>				
Reserve for fire insurance .....	\$2,863,207.16	\$2,412,709.10	\$450,498.06	.....
<b>776. RESERVE FOR DEPRECIATION</b> .....	65,140,992.96	59,622,268.20	5,518,724.76	.....
<b>778. OTHER UNADJUSTED CREDITS:</b>				
Contingent interest .....	678,366.09	989,909.00	.....	\$311,542.91
Miscellaneous items .....	3,140,527.88	3,933,236.71	.....	792,708.83
Total Unadjusted Credits .....	\$71,823,094.09	\$66,958,123.01	\$4,864,971.08	.....
<b>Total Liabilities</b> .....	<b>\$865,036,719.69</b>	<b>\$857,092,532.03</b>	<b>\$7,944,187.66</b>	.....
<b>Surplus:</b>				
APPROPRIATED FOR ADDITIONS AND BETTERMENTS .....	\$30,309,935.20	\$30,182,674.16	↑ \$127,261.04	.....
RESERVED FOR DEPRECIATION OF SECURITIES .....	34,972,570.88	34,972,570.88	.....	.....
FUNDED DEBT RETIRED THROUGH INCOME AND SURPLUS .....	536,828.66	536,828.66	.....	.....
SINKING FUND RESERVES .....	145,239.43	207,169.80	.....	\$61,930.37
Total Appropriated Surplus .....	\$65,964,574.17	\$65,899,243.50	\$65,330.67	.....
<b>784. Profit and Loss—Credit Balance</b> .....	216,440,025.03	203,743,963.24	12,696,061.79	.....
Total Surplus .....	\$282,404,599.20	\$269,643,206.74	\$12,761,392.46	.....
As this consolidated balance sheet excludes all intercompany items, securities of the Los Angeles & Salt Lake Railroad Company owned by other System companies are not included. The difference between the par and face value of such securities as carried on the books of the Los Angeles & Salt Lake (less unextinguished discount on the bonds and discount charged to Profit and Loss but added back in consolidating the accounts) and the amounts at which the securities are carried on the books of the owning System companies is set up here to balance .....	\$31,672,876.22	\$31,673,367.91	.....	\$491.69
<b>Grand Total</b> .....	<b>\$1,179,114,195.11</b>	<b>\$1,158,409,106.68</b>	<b>\$20,705,088.43</b>	.....

† These amounts respectively represent donations made during the year by counties and municipalities and by individuals and companies in part payment for improvements, such as road crossings, drainage projects, and industry spur tracks, the cost of which was charged to "Investment in Road and Equipment." These amounts are so accounted for to conform with regulations of the Interstate Commerce Commission.

[ADVERTISEMENT]

# Chicago and North Western Railway Company

## Report of the Board of Directors

TO THE STOCKHOLDERS OF THE CHICAGO AND NORTH WESTERN RAILWAY COMPANY:

The Board of Directors submits herewith its report of the operations and affairs of the Company for the year ending December 31, 1927.

Average mileage of road operated, 8,465.15.

<b>OPERATING REVENUES:</b>	
Freight .....	\$108,330,428.43
Passenger .....	25,183,382.18
Other Transportation .....	13,532,420.04
Incidental .....	3,086,729.04
	<b>\$150,132,959.69</b>
<b>OPERATING EXPENSES:</b>	
Maintenance of Way and Structures..	\$22,230,790.83
Maintenance of Equipment .....	29,389,959.05
Traffic .....	2,487,715.86
Transportation .....	58,118,912.92
Miscellaneous Operations .....	1,088,549.53
General .....	4,238,657.21
Transportation for Investment—Cr.....	Cr. 560,318.30
	<b>116,994,267.10</b>
Percentage of Expenses to Revenues.....	77.93
Net Revenue from Railway Operations, forwarded...	<b>\$33,138,692.59</b>
<b>DEDUCTIONS FROM REVENUE:</b>	
Railway Tax Accruals (6.52 per cent of Revenues) .....	\$9,783,807.24
Uncollectible Railway Revenues.....	33,461.67
Equipment Rents—Net .....	2,828,804.23
Joint Facility Rents—Net.....	234,925.93
	<b>12,880,999.07</b>
Net Railway Operating Income.....	<b>\$20,257,693.52</b>
<b>NONOPERATING INCOME:</b>	
Rental Income .....	\$829,059.79
Dividend Income .....	1,476,124.00
Income from Funded Securities.....	32,724.41
Income from Unfunded Securities and Accounts, and Other Items.....	501,917.88
	<b>2,839,826.08</b>
Gross Income .....	<b>\$23,097,519.60</b>
<b>DEDUCTIONS FROM GROSS INCOME:</b>	
Rental Payments .....	\$35,211.83
Interest on Funded Debt.....	12,995,820.21
Other Deductions .....	140,424.75
	<b>13,171,456.79</b>
Net Income .....	<b>\$9,926,062.81</b>
<b>DIVIDENDS:</b>	
7% on Preferred Stock.....	\$1,567,650.00
4% on Common Stock.....	6,333,228.00
	<b>7,900,878.00</b>
Balance Income for the Year.....	<b>\$2,025,184.81</b>

## General Remarks

In the annual report of last year reference was made to the program under way for revision and enlargement of Proviso Yard. Substantial progress has been made on this program during the year. The less than carload freight transfer house was completed and placed in operation on October 1, 1927. The main building is 1,420 feet long and 626 feet wide, and contains two receiving platforms each 1,420 feet long and 44 feet wide, and ten loading platforms each 1,420 feet long and 22 feet wide, which are served by 24 tracks, with a total car capacity of 690 cars. This building is of steel-frame construction on pile foundation. The platforms are timber on pile foundation. Thirty-five tractors and 2,000 trailers have been provided for transferring freight. There have also been provided auxiliary facilities consisting of a three-story concrete and brick office and record building, a ten-ton electrically operated gantry crane for handling machinery and other heavy freight, a 150-ton track scale, a tractor garage, and an incineration plant. A yard consisting of 33 tracks, having a capacity of 60 to 100 cars each, was completed to serve as a receiving yard for cars from the Indiana Harbor Belt Railroad. A repair yard containing 14 tracks, capable of holding 34 cars each, together with necessary buildings for housing materials, located near Wolf Road, was completed, and the grading for an east-bound classification yard, which will be of the gravity type, was begun.

Track elevation work in Chicago in the vicinity of Mayfair was substantially completed. Four main tracks on the Wisconsin Division for a distance of 1.2 miles, have been elevated, together with three main tracks on the Mayfair Cut-off for a distance of 1.08 miles, and yard tracks at Mayfair yard. An extension of this elevation northward on the Cut-off from Lawrence Avenue to the Chicago River, a distance of .91 of a mile, was begun, and the elevation of the Mayfair Cut-off and the third and fourth track line north of the Chicago River, for distances of .85 and .23 of a mile, respectively, was authorized and will be carried out

during the year 1928.

Automatic train control installation on the Galena Division from Chicago to Clinton, Iowa, was begun and will be completed about May 1, 1928. With the completion of this section of train control, the entire main line between Chicago and Council Bluffs, Iowa, a distance of 485 miles, will be protected by automatic train control.

A new station was established 1.7 miles north of Arlington Heights, known as Arlington Park, where a race track has been established by the American National Jockey Club. Extensive platforms, side tracks and a pedestrian subway have been provided to accommodate the large passenger traffic resulting from the operation of this race track.

A brick and stucco passenger station 22 x 79 feet was constructed at Lombard, Illinois, replacing a frame building, and a frame and stucco passenger station building 21 x 48 feet, was constructed at Land O'Lakes, Wisconsin, replacing a frame building destroyed by fire.

The enlargements of the tie treating plants at Riverton, Wyoming, and Escanaba, Michigan, mentioned in last year's report, were completed and put in operation in February and July, respectively.

A water treating plant of 21,000 gallon capacity was completed and placed in service at South Pekin, Illinois.

A 5,000 ton capacity ice-house was constructed at Madison, Wisconsin.

A 150 ton mechanical coaling station of reinforced concrete was constructed at De Kalb, Illinois, replacing an old plant which was destroyed by fire.

A large heating plant was constructed at the Chicago Avenue engine house, with a system of pipe connections so arranged that the suburban passenger locomotives which are cared for at this point may be supplied with hot water and steam, ready for departure, without the necessity of fires in their fire boxes, thereby resulting in the abatement of smoke attendant upon firing up and holding engines with their fires burning, together with the saving in coal.

Base yards for the purpose of bettering the industrial switching in the Chicago Terminal were constructed at Avondale, Weber and Cragin, and a suburban passenger coach yard was constructed at Des Plaines.

A freight car storage track, 2,200 feet in length was constructed at Combined Locks, Wisconsin, to improve switching conditions at industries in that locality.

At Carter, Wisconsin, a spur track 2,700 feet in length and a wye track 1,000 feet long, were built to connect with the logging railroad of the Oconto Lumber Company.

Approximately 175 new industry tracks were built on the system during the year, most of which were for the service of newly established industries; the balance for the accommodation of enlarged plants of existing industries. One of the most important of these was the Belle Fourche, South Dakota, at which point the Utah-Idaho Sugar Company constructed a large refinery for the manufacture of sugar from sugar beets, which will be raised in this territory on irrigated land. In addition to the construction of industry tracks at this plant, the Company constructed two main spurs, one 12.13 miles in length, extending from Nisland southeasterly to Vale, along the Belle Fourche River and through the territory irrigated from the Belle Fourche Irrigation System, and the other 3.74 miles in length, extending southwest from Redwater through the irrigated valley of the Redwater River. These lines were placed in operation in October. 2,969 carloads of freight, with revenue of \$330,000.00, resulted from the operation of this industry in 1927. Substantial increases will follow in future years as additional land is brought under cultivation.

The Company acquired new motive power during the year, consisting of:

- 12 Heavy Freight Locomotives.
- 8 Switching Locomotives.
- 1 Oil-Electric Switching Locomotive.

New freight equipment consisting of:

- 591 Steel Underframe Stock Cars.
- 100 Steel Flat Cars.
- 250 Steel Ore Cars.
- 500 Steel Hopper Cars.
- 500 Steel Underframe Box Cars.

New passenger equipment consisting of:

- 5 Gasoline-Electric Motor Passenger Cars.
- 2 Baggage-Dormitory Cars.
- 4 Dining Cars.
- 8 Baggage Cars.
- 3 Combination Baggage-Passenger Cars.

- 100 Passenger Coaches, equipped with roller bearings, capable of seating 98 passengers each, and designed especially for suburban passenger service.

- 20 Combination Passenger-Baggage Cars of similar design and construction, also intended for suburban passenger service.

[ADVERTISEMENT]



In addition to the foregoing, the Company constructed at its shops, 1,000 steel underframe automobile cars, 1,335 steel underframe box cars, and rebuilt 10 baggage cars.

During the year 1927 wage increases were granted, which added approximately \$1,360,000.00 to the payroll.

In anticipation of the coal strike your Company was required to store in excess of 1,000,000 tons of coal. The strike, however, was one of unusual duration, with result that your Company was obliged to go into the open market and purchase coal from eastern fields, on account of which operating expenses were increased, after due allowance for quality of the fuel, approximately \$685,000.00.

In addition to the increase in operating expenses due to increased wages and the coal strike, there was also an increase of \$841,057.00, caused by the retirement of old and worn out equipment in excess of similar retirements in the year 1926.

The surplus after interest and dividends decreased \$2,583,757.00.

Therefore, the three items mentioned, to-wit: increase in wages, coal strike and increased retirement of equipment equal \$2,886,057.00, exceeding the decrease in surplus by \$302,300.00. In other words, without these increases in operating charges over 1926, your Company's surplus would have exceeded the surplus for 1926 by \$302,300.00, notwithstanding a decrease in gross revenue of \$4,202,764.00 for the year. The operating ratio for 1926 was 78.13% and in 1927 it was 77.93%.

### Capital Stock

Pursuant to resolutions adopted by the Board of Directors and Stockholders, providing for the issue of common stock in exchange for the preferred and common stocks of the Chicago, Saint Paul, Minneapolis and Omaha Railway Company, the common stock and scrip of this Company was increased \$1,702,442.87 during the year by the issuance of that amount in exchange for 7,642 shares of the preferred stock and 7,786 shares of the common stock of the Chicago, St. Paul, Minneapolis and Omaha Railway Company, on the basis of three shares of North Western common for two shares of Omaha preferred, and five shares of North Western common for seven shares of Omaha common.

The only other change during the year in the Capital Stock was the purchase by the Company of \$30.00 of its Common Stock Scrip.

The authorized Capital Stock of the Company is Two Hundred Million Dollars (\$200,000,000.00) of which the following has been issued to December 31, 1927:

HELD BY THE PUBLIC:	
Common Stock and Scrip.....	\$158,444,925.25
Preferred Stock and Scrip.....	22,395,120.00
Total Stock and Scrip held by the Public.....	\$180,840,045.25
HELD IN TREASURY:	
Common Stock and Scrip.....	\$2,343,687.15
Preferred Stock and Scrip.....	3,834.56
Total Stock and Scrip held in Treasury.....	2,347,521.71
Total Capital Stock and Scrip, December 31, 1927..	\$183,187,566.96

### Funded Debt

At the close of the preceding year, the amount of Funded Debt held by the Public was..... \$255,544,100.00

The above amount has been increased by Bonds and Equipment Trust Certificates sold during the year ending December 31, 1927, as follows:

C. & N. W. Ry. First and Refunding Mortgage, 4½%, sold to reimburse the Company for past expenditures made for construction, and in redeeming and retiring underlying bonds...	\$20,572,000.00
C. & N. W. Ry. Equipment Trust Certificates of 1925, 4½% (secured by Series "R" and "S" equipment of the Equipment Trust of 1925):	
Series "R" .....	\$1,950,000.00
Series "S" .....	2,610,000.00
	4,560,000.00
	25,132,000.00
Forwarded .....	\$280,676,100.00

And the above amount has been decreased during the year ending December 31, 1927, by Bonds and Equipment Trust Certificates redeemed, as follows:

C. & N. W. Ry. Sinking Fund of 1879, 6% .....	\$49,000.00
C. & N. W. Ry. Sinking Fund of 1879, 5% .....	103,000.00
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5% .....	251,000.00
C. & N. W. Ry. Equipment Gold Notes of 1920, 6% (including \$1,000.00 un-presented and transferred to "Current Liabilities") .....	664,900.00

C. & N. W. Ry. Equipment Trust Certificates of 1920, 6½%:	
Series "J" .....	\$186,000.00
Series "K" .....	267,000.00
	453,000.00
C. & N. W. Ry. Equipment Trust Certificates of 1922, 5%:	
Series "M" .....	\$345,000.00
Series "N" .....	317,000.00
	662,000.00
C. & N. W. Ry. Equipment Trust Certificates of 1923, 5% (including \$2,000.00 Series "O" un-presented and transferred to "Current Liabilities"):	
Series "O" .....	\$412,000.00
Series "P" .....	104,000.00
	516,000.00

Total Funded Debt Redeemed.....	2,698,900.00
Leaving Funded Debt held by the Public, December 31, 1927 .....	\$277,977,200.00

### Lands

During the year ending December 31, 1927, 32,834.00 acres and 40 town lots of the Company's Land Grant lands were sold for the total consideration of \$599,052.73. The number of acres remaining in the several Grants December 31, 1927, amounted to 113,660.49 acres, of which 1,068.38 acres were under contract for sale, leaving unsold 112,592.11 acres.

Appended hereto may be found statements, accounts and statistics relating to the business of the fiscal year and the condition of the Company's affairs on December 31, 1927.

The Board gratefully acknowledges its appreciation of the loyal and efficient services rendered by officers and employees during the year.

By order of the Board of Directors.

FRED W. SARGENT,  
President.

CHICAGO, April 2, 1928.

### Comparative Statement of Income Account

	Year Ending Dec. 31, 1926	Year Ending Dec. 31, 1927	+ Increase — Decrease
Average mileage of road operated .....	8,458.91	8,465.15	+ 6.24
OPERATING REVENUES:			
Freight .....	\$110,229,474.60	\$108,330,428.43	—\$1,899,046.17
Passenger .....	26,592,517.32	25,183,382.18	— 1,409,135.14
Other Transportation .....	14,288,344.85	13,532,420.04	— 755,924.81
Incidental .....	3,225,387.37	3,086,729.04	— 138,658.33
Total Operating Revenues .....	\$154,335,724.14	\$150,132,959.69	—\$4,202,764.45
OPERATING EXPENSES:			
Maintenance of Way and Structures .....	\$23,290,735.95	\$22,230,790.83	—\$1,059,945.12
Maintenance of Equipment .....	31,917,474.48	29,389,959.05	— 2,527,515.43
Traffic .....	2,453,744.30	2,487,715.86	+ 33,971.56
Transportation .....	58,127,865.55	58,118,912.92	— 8,952.63
Miscellaneous Operations .....	1,081,255.15	1,088,549.53	+ 7,294.38
General .....	4,075,241.37	4,238,657.21	+ 163,415.84
Transportation for Investment—Cr. ....	Cr. 357,933.35	Cr. 560,318.30	— 202,384.95
Total Operating Expenses .....	\$120,588,383.45	\$116,994,267.10	—\$3,594,116.35
Net Revenue from Railway Operations .....	\$33,747,340.69	\$33,138,692.59	— \$608,648.10
DEDUCTIONS FROM REVENUE:			
Railway Tax Accruals .....	\$9,278,362.96	\$9,783,807.24	+ \$505,444.28
Uncollectible Railway Revenues .....	39,530.45	33,461.67	— 6,068.78
Equipment Rents—Net .....	1,901,712.54	2,828,804.23	+ 927,091.69
Joint Facility Rents—Net .....	232,595.55	234,925.93	+ 2,330.38
Total Deductions .....	\$11,452,201.50	\$12,880,999.07	+ \$1,428,797.57
Net Railway Operating Income .....	\$22,295,139.19	\$20,257,693.52	—\$2,037,445.67
NONOPERATING INCOME:			
Rental Income .....	\$798,083.19	\$829,059.79	+ \$30,976.60
Dividend Income .....	1,383,404.72	1,476,124.00	+ 92,719.28
Income from Funded Securities .....	34,243.00	32,724.41	— 1,518.59
Income from Unfunded Securities and Accounts, and Other Items .....	489,671.98	501,917.88	+ 12,245.90
Total Nonoperating Income .....	\$2,705,402.89	\$2,839,826.08	+ \$134,423.19
Gross Income .....	\$25,000,542.08	\$23,097,519.60	—\$1,903,022.48
DEDUCTIONS FROM GROSS INCOME:			
Rental Payments .....	\$10,286.96	\$35,211.83	+ \$24,924.87
Interest on Funded Debt .....	12,406,812.11	12,995,820.21	+ 589,008.10
Other Deductions .....	163,601.68	140,424.75	— 23,176.93

[ADVERTISEMENT]

Total Deductions.....	\$12,580,700.75	\$13,171,456.79	+ \$590,756.04
Net Income .....	\$12,419,841.33	\$9,926,062.81	—\$2,493,778.52
<b>DIVIDENDS:</b>			
On Preferred Stock (7%)	\$1,567,650.00	\$1,567,650.00	.....
On Common Stock (4%)	6,243,250.00	6,333,228.00	+ \$89,978.00
Total Dividends .....	\$7,810,900.00	\$7,900,878.00	+ \$89,978.00
Balance Income for the Year, carried to Profit and Loss....	\$4,608,941.33	\$2,025,184.81	—\$2,583,756.52

**Profit and Loss—December 31, 1927**

Dr.

CHARGES FOR THE YEAR ENDING DECEMBER 31, 1927:

Depreciation accrued prior to July 1, 1907, on equipment retired or changed from one class to another.....	\$585,988.08
Net loss on property sold or abandoned and not replaced.	1,296,001.05
Debt discount incurred during the year extinguished through surplus .....	1,569,380.31
Credit Balance, December 31, 1927, carried to Balance Sheet	65,791,762.56
	\$69,243,132.00

Cr.

Credit Balance, December 31, 1926.....	\$66,545,610.81
<b>CREDITS FOR THE YEAR ENDING DECEMBER 31, 1927:</b>	
Credit Balance of current year's Income, brought forward from Income Account .....	2,025,184.81
Net profit from sale of Land Grant lands.....	594,583.51
Net Miscellaneous Credits.....	77,752.87
	\$69,243,132.00

**Comparative General Balance Sheet  
(8,389.24 Miles)**

December 31, 1926	ASSETS.	December 31, 1927	December 31, 1926	LIABILITIES	December 31, 1927
	<b>INVESTMENTS.</b>			<b>CAPITAL STOCK.</b>	
\$509,950,501.80	Investment in Road and Equipment.....	\$529,655,225.14	\$179,137,632.38	Held by Public.....	\$180,840,045.25
874,529.57	Miscellaneous Physical Property.....	835,888.55	2,347,491.71	Held in Treasury.....	2,347,521.71
2,183,335.79	Investment in Affiliated Companies.....	2,175,835.79		Total Capital Stock.....	\$183,187,566.96
10,337,152.29	Investment in Other Companies:		\$181,485,124.09	Premium Realized on Capital Stock.....	29,657.75
	Capital Stock of Chicago, St. Paul, Minneapolis and Omaha Ry. Co. (149,200 Shares), acquired by purchase .....	10,337,152.29	\$181,514,781.84	Total Capital Stock and Premium..	\$183,217,224.71
11,586,528.56	Capital Stock of Chicago, St. Paul, Minneapolis and Omaha Ry. Co. (130,060 Shares), acquired in exchange for C. & N. W. Ry. Co. Common Stock .....	13,288,971.43	\$255,544,100.00	<b>LONG TERM DEBT.</b>	
3,910,575.93	Preferred Stock of Union Pacific Railroad Company (41,715 Shares).....	3,910,575.93	36,480,000.00	Funded Debt Held by the Public.....	\$277,977,200.00
220,642.50	Miscellaneous .....	195,292.50	35,500,000.00	Funded Debt Held in Treasury and Due from Trustee:	
538,992.12	Other Investments .....	540,713.33	\$327,524,100.00	Unpledged .....	15,163,000.00
\$539,602,258.56	Total Investments .....	\$560,939,654.96		Pledged .....	35,500,000.00
	<b>CURRENT ASSETS.</b>			Total Long Term Debt.....	\$328,640,200.00
\$7,430,401.67	Cash .....	\$10,196,995.90	\$4,211,240.33	<b>CURRENT LIABILITIES.</b>	
70,000.00	Loans and Bills Receivable.....	130,000.00	6,509,348.01	Traffic and Car Service Balances Payable	\$4,084,737.91
440,528.79	Traffic and Car Service Balances Receivable .....	1,371,771.33	323,138.56	Audited Accounts and Wages Payable...	6,424,767.41
2,684,797.25	Net Balance Receivable from Agents and Conductors .....	2,701,427.28	757,060.84	Miscellaneous Accounts Payable.....	275,872.93
4,824,106.32	Miscellaneous Accounts Receivable.....	5,730,242.26	10,549.20	Interest Matured Unpaid.....	745,111.34
13,509,202.23	Material and Supplies.....	12,564,849.27	2,135,462.46	Dividends Matured Unpaid.....	26,199.70
268,413.01	Other Current Assets.....	369,707.28	364,667.91	Unmatured Interest Accrued.....	2,237,397.04
\$29,227,449.27	Total Current Assets.....	\$33,064,993.32	\$14,311,467.31	Other Current Liabilities.....	272,595.74
	<b>UNADJUSTED DEBITS.</b>			Total Current Liabilities.....	\$14,066,682.07
\$30,366.93	Advances account Equipment Purchased under Trust Agreements.....	\$4,542.84	\$7,135,689.00	<b>UNADJUSTED CREDITS.</b>	
2,347,491.71	Capital Stock and Scrip, C. & N. W. Ry. Co., Held in Treasury.....	2,347,521.71	515,995.26	Tax Liability .....	\$6,807,241.00
36,480,000.00	Company Bonds Held in Treasury and Due from Trustee:		44,259,584.66	Premium on Funded Debt.....	557,432.17
35,500,000.00	Unpledged .....	15,163,000.00	1,233,080.40	Accrued Depreciation—Equipment .....	45,443,238.59
2,460,770.67	Pledged .....	35,500,000.00	\$53,144,349.32	Other Unadjusted Credits.....	2,033,976.57
\$76,818,629.31	Other Unadjusted Debits.....	2,305,452.09	\$2,608,027.86	Total Unadjusted Credits.....	\$54,841,888.33
\$645,648,337.14	Total Unadjusted Debits.....	\$55,320,516.64	66,545,610.81	<b>CORPORATE SURPLUS.</b>	
	Total Assets .....	\$649,325,164.92	\$69,153,638.67	Additions to Property Through Surplus..	\$2,767,407.25
			\$645,648,337.14	Profit and Loss.....	65,791,762.56
				Total Corporate Surplus.....	\$68,559,169.81
				Total Liabilities .....	\$649,325,164.92

**Chicago, Saint Paul, Minneapolis and Omaha Railway Company****Report of the Board of Directors**

TO THE STOCKHOLDERS OF THE CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY:

The Board of Directors submits herewith its report of the operations and affairs of the Company for the year ended December 31, 1927.

Mileage of road operated, 1,746.53

<b>OPERATING REVENUES:</b>		
Freight .....	\$20,071,438.70	
Passenger .....	4,647,981.65	
Other Transportation .....	1,774,639.72	
Incidental .....	353,044.63	
	\$26,847,104.70	
<b>OPERATING EXPENSES:</b>		
Maintenance of Way and Structures .....	\$4,273,991.69	
Maintenance of Equipment .....	4,890,233.92	
Traffic .....	413,805.02	
Transportation .....	11,207,906.40	
Miscellaneous Operations .....	150,078.56	
General .....	914,749.91	
Transportation for Investment—Cr....Cr.	50,520.14	
	21,800,245.36	
Percentage of Expenses to Revenue ..	81.20	
Net Revenue from Railway Operations, forwarded .....	\$5,046,859.34	
<b>DEDUCTIONS FROM REVENUE:</b>		

Railway Tax Accruals (4.94 per cent. of Revenues) .....	\$1,326,540.29
Uncollectible Railway Revenue .....	7,555.97
Equipment Rents—Net .....	619,449.94
Joint Facility Rents—Net .....	413,891.88
	2,367,438.08
Net Railway Operating Income .....	\$2,679,421.26
<b>NONOPERATING INCOME:</b>	
Rental Income .....	\$56,698.96
Dividend Income .....	37,660.45
Income from Funded Securities .....	5,586.32
Income from Unfunded Securities and Accounts, and Other Items .....	95,719.84
	195,665.57
Gross Income .....	\$2,875,086.83
<b>DEDUCTIONS FROM GROSS INCOME:</b>	
Rental Payments .....	\$2,003.51
Interest on Funded Debt .....	2,513,550.02
Other Deductions .....	39,648.37
	2,555,201.90
Net Income .....	\$319,884.93

The freight revenues for the year increased \$723,432.56 or 3.74 per cent., as compared with the preceding year. The improvement in the agricultural conditions through the territory served by the Company was reflected by an increase in revenue from transportation of agricultural products, which somewhat exceeded the total increase in freight revenue.

In the transportation of wheat, alone, there was an increase

(ADVERTISEMENT)



in tons handled, as compared with the preceding year, of 28.36 per cent., with increase in revenue therefrom of 38.67 per cent. The increase in revenue per ton was largely due to an increase of approximately eight miles, or 5.25 per cent., in the average haul per car of wheat.

The transportation of barley, likewise, showed a large increase; the number of tons handled was doubled, and the revenue, with increased average haul, more than doubled.

Products of mines also contributed to the increase in freight revenues through increased movements of coal, coke and sand and gravel. Other commodities, however, as a general thing showed no increase of moment, or small decreases.

Passenger revenues for the year continued the decline which had characterized the preceding six years, the decrease for the year being \$290,015.72 or 5.87 per cent., as compared with the year 1926.

Contrary to the experience of the past few years during which the decrease in passenger traffic occurred very largely in the "short haul" local business, the decrease in 1927, as compared with 1926, extended equally to all classes of the traffic.

Although the increase in gross revenues totaled \$414,085.69, operating expenses increased \$527,296.67, or 2.48 per cent., as compared with the preceding year. The increase in charges for Maintenance of Way and Structures, was \$480,154.62, which was attributable to increased charges for ties, rails, other track material and ballast, together with the labor cost of application.

Charges for Maintenance of Equipment were held to practically the basis of the preceding year, the increase being \$1,256.35.

Transportation Expenses, while showing an increase of \$33,445.38, continued to show the result of various economies effected, the year closing with a further reduction in ratio to operating revenues of .52 per cent. Evidences of increased efficiency in train operation were an increase of 6.89 per cent., in gross tons handled per train, an increase of 1.19 per cent., in the daily mileage of locomotives, and, due in part to the greater volume of grain, coal, sand and other heavy commodities handled, an increase of 9.64 per cent., in the tons of freight handled per train.

During the year 1927 there were added to the freight equipment of the Company, five hundred steel underframe box cars.

#### Funded Debt

At the close of the preceding year the amount of Funded Debt, held by the Public, was.....\$46,082,200.00

The above amount has been increased by the Equipment Trust Certificates sold during the year ended December 31, 1927, as follows:

Chicago, Saint Paul, Minneapolis and Omaha Railway Equipment Trust Certificates of 1917, Series "C," 4 3/4% .....	\$369,000.00	
Chicago, Saint Paul, Minneapolis and Omaha Railway Equipment Trust Certificates of 1917, Series "D," 4 3/4% .....	830,000.00	
		1,199,000.00
		\$47,281,200.00

And the above amount has been decreased during the year ended December 31, 1927, by Equipment Trust Certificates redeemed, as follows:

Chicago, Saint Paul, Minneapolis and Omaha Railway Equipment Gold Notes, 6%, redeemed .....	\$156,800.00	
Chicago, Saint Paul, Minneapolis and Omaha Railway Equipment Trust Certificates of 1917, Series "A," 7%, redeemed ..	110,000.00	
Chicago, Saint Paul, Minneapolis and Omaha Railway Equipment Trust Certificates of 1917, Series "B," 7%, redeemed ..	95,000.00	
Total Funded Debt redeemed .....		361,800.00

Leaving Funded Debt held by the Public, December 31, 1927 .....

#### Capital Stock

There has been no change since the close of the preceding year in the Capital Stock and Scrip of the Company.

The Company's authorized Capital Stock is Fifty Million Dollars (\$50,000,000), of which the following has been issued to December 31, 1927.

OUTSTANDING:		
Common Stock and Scrip .....	\$18,559,086.69	
Preferred Stock and Scrip .....	11,259,859.09	
		\$29,818,945.78
OWNED BY THE COMPANY:		
Common Stock and Scrip .....	\$2,844,206.64	
Preferred Stock and Scrip .....	1,386,974.20	
		4,231,180.84
Total Capital Stock and Scrip, December 31, 1927 ...		\$34,050,126.62

Appended hereto may be found Statements and Accounts relating to the business of the Company for the year, and the condition of its affairs on December 31, 1927.

The Board desires to express its appreciation to the officers and employees of the Company for their loyal and efficient service during the year.

By order of the Board of Directors.

FRED W. SARGENT,  
President.

St. Paul, Minnesota, April 2, 1928.

#### Comparative General Balance Sheet (1,676.71 Miles)

December 31, 1926	ASSETS.	December 31, 1927	December 31, 1926	LIABILITIES.	December 31, 1927
	INVESTMENTS.			CAPITAL STOCK.	
\$ 89,391,063.86	Investment in Road and Equipment .....	\$ 90,135,651.50	\$ 29,818,945.78	Held by Public .....	\$ 29,818,945.78
544,237.46	Miscellaneous Physical Property .....	497,933.89	4,231,180.84	Held in Treasury .....	4,231,180.84
385,302.99	Investment in Affiliated Companies .....	392,885.18		Total Capital Stock .....	\$ 34,050,126.62
11,492.74	Other Investments .....	15,200.76	\$ 34,050,126.62		
\$ 90,332,097.05	Total Investments .....	\$ 91,041,671.33		LONG TERM DEBT.	
	CURRENT ASSETS.			(See statement, page 17)	
\$ 563,333.39	Cash .....	\$ 805,249.30	\$ 46,082,200.00	Funded Debt Held by the Public .....	\$ 46,919,400.00
50,634.71	Traffic and Car Service Balances Receivable .....	32,739.07	410,634.09	Equipment Trust Certificates and Scrip	
462,781.08	Net Balance Receivable from Agents and			Owned by the Company .....	634.09
796,226.40	Conductors .....	504,627.45	\$ 46,492,834.09	Total Long Term Debt .....	\$ 46,920,034.09
2,392,443.11	Miscellaneous Accounts Receivable .....	574,988.34			
	Material and Supplies .....	2,644,948.35		CURRENT LIABILITIES.	
\$ 4,265,418.69	Total Current Assets .....	\$ 4,562,552.51		Traffic and Car Service Balances Payable ..	\$ 790,334.21
	UNADJUSTED DEBITS.			Audited Accounts and Wages Payable ...	3,454,938.48
\$ 73,230.55	Discount on Funded Debt .....	\$ 50,290.50	\$ 894,201.38	Miscellaneous Accounts Payable .....	184,545.24
2,844,206.64	Common Stock and Scrip, C. St. P. M. &		2,327,871.66	Interest Matured Unpaid .....	51,281.00
1,386,974.20	O. Ry. Co., Held in Treasury .....	2,844,206.64	95,942.05	Dividends Matured Unpaid .....	8,072.50
410,000.00	Preferred Stock and Scrip, C. St. P. M. &	1,386,974.20	56,983.50	Unmatured Interest Accrued .....	433,880.58
	O. Ry. Co., Held in Treasury .....		4,072.50	Funded Debt Matured Unpaid .....	500.00
	Equipment Trust Certificates of 1917 Series		429,292.17		
	"C," Held in Treasury .....		500.00	Total Current Liabilities .....	\$ 4,923,552.01
	Consolidated Mortgage Bond Scrip Due		\$ 3,808,863.26		
	from Central Union Trust Company ...	634.09		UNADJUSTED CREDITS.	
	Other Unadjusted Debits .....	473,834.54	\$ 432,559.40	Tax Liability .....	\$ 348,901.11
\$ 5,147,461.88	Total Unadjusted Debits .....	\$ 4,755,939.97	107,506.90	Premium on Funded Debt .....	89,995.92
			7,397,495.52	Accrued Depreciation—Equipment .....	7,435,885.93
			340,595.20	Other Unadjusted Credits .....	197,709.35
			\$ 8,278,157.02	Total Unadjusted Credits .....	\$ 8,072,492.31
				CORPORATE SURPLUS.	
			\$ 1,174,736.97	Additions to Property Through Surplus ..	\$ 1,184,155.04
			5,940,259.66	Profit and Loss .....	5,209,803.74
			\$ 7,114,996.63	Total Corporate Surplus .....	\$ 6,393,958.78
\$ 99,744,977.62	Total Assets .....	\$100,360,163.81	\$ 99,744,977.62	Total Liabilities .....	\$100,360,163.81

[ADVERTISEMENT]

# Eleventh Annual Report of Missouri Pacific Railroad Company, Year Ended December 31, 1927

ST. LOUIS, Mo., March 1, 1928.

## TO THE STOCKHOLDERS:

There is submitted herewith report of the operations and affairs of the Company as of December 31, 1927.

## Corporate Income Statement

FOR THE YEAR ENDED DECEMBER 31, 1927, COMPARED WITH THE PREVIOUS YEAR.

	1927	1926	Decrease
Railway Operating Revenues..	\$125,728,405.41	\$133,990,294.39	\$8,261,888.98
Railway Operating Expenses..	99,565,997.86	102,851,943.72	3,285,945.86
Net Revenue from Railway Operations .....	\$26,162,407.55	\$31,138,350.67	\$4,975,943.12
Railway Taxes and Uncollectible Railway Revenue.....	\$4,815,607.56	\$5,649,504.35	\$833,896.79
Railway Operating Income..	\$21,346,799.99	\$25,488,846.32	\$4,142,046.33
Other Operating Income....	1,502,895.16	1,282,312.93	*220,582.23
Total Operating Income....	\$22,849,695.15	\$26,771,159.25	\$3,921,464.10
Deductions from Operating Income .....	5,950,196.72	6,437,373.49	487,176.77
Net Railway Operating Income .....	\$16,899,498.43	\$20,333,785.76	\$3,434,287.33
Non-Operating Income ....	3,823,766.75	3,621,286.12	*202,480.63
Gross Income .....	\$20,723,265.18	\$23,955,071.88	\$3,231,806.70
Deductions from Gross Income .....	16,322,068.90	15,323,404.87	*998,664.03
Net Income transferred to Profit and Loss.....	\$4,401,196.28	\$8,631,667.01	\$4,230,470.73

\* Increase.

## Federal Valuation

The Interstate Commerce Commission served its tentative valuation on your Company, May 23, 1927. This valuation is based upon an inventory of the property as of June 30, 1918, to which prices intended to represent those of 1914 and prior, have been applied. The valuation does not include miscellaneous physical property or investments in other Companies.

Following the formal protest to this tentative valuation, filed in accordance with the law, on June 18, 1927, the hearing on the protest began September 20, 1927, and was still in progress at the close of the year.

## Income

A brief comparative statement of the Corporate Income is shown above, subdivided to indicate the "Net Railway Operating Income" defined in the Transportation Act of 1920.

## Operations (Compared with Previous Year)

The Operating Revenues were disappointing, due to the strike of coal mine employees, April 1st, 1927, which extended over a period of six months; the disastrous flood of the Mississippi River and its tributaries, which paralyzed industry in the South and the effect of these upon general business in the territory served by our lines.

Total Railway Operating Revenues for the year were \$125,728,405.41 as compared with \$133,990,294.39 in the previous year, a decrease of \$8,261,888.98, or 6.17%. The decrease in Freight Revenues was \$7,125,238.19, or 6.60%.

The principal decreases were Products of Agriculture, \$1,794,798.74, and Products of Forests, \$1,696,064.22, due to a lack of production in the territory affected by the flood. Products of Mines decreased \$3,533,309.57, due principally to the closing of the majority of the coal mines served by our rails, on account of the strike beginning April 1st, 1927, and the change to pipe line transportation of crude petroleum.

Corn, Oats, Hay, Straw and Alfalfa, included in the Products of Agriculture, show a decrease of \$1,067,890.78; Cotton, Cotton Seed and Products, a decrease of \$820,382.14.

The decrease in revenue from Bituminous Coal, included in Products of Mines, was \$1,231,748.68; Clay, Gravel, Sand and Stone, show a decrease of \$206,402.17, and Crude Petroleum, \$2,277,603.74.

The Total Number of tons of Revenue Freight Handled, decreased 7.41%, and the Ton Miles decreased 7.36%. The Average Revenue Per Ton Mile was 10.74 mills as compared with 10.65 mills in the previous year.

The Passenger Revenue for the current year was \$14,652,502.50, as compared with \$16,035,972.47, a decrease of 8.63%. Passengers Carried shows a decrease of 13.59% and the Passengers Carried One Mile, a decrease of 6.18%. The continued diversion of short haul passenger traffic to motor vehicles operated over public highways is illustrated by the increase in the Average Distance Each Passenger Carried of 7.21 miles, or 8.59%. The Average Revenue Per Passenger Per Mile was \$0.0318, compared with \$0.0327 last year.

Total Railway Operating Expenses decreased \$3,285,945.86, or 3.19%.

Expenditures for Maintenance of Way and Structures were \$21,820,236.37, including \$2,131,812.31, covering direct cost of restoring flood damages, an increase of \$558,208.50. Maintenance of Equipment Expenditures show a decrease of \$2,768,039.56, and the Transportation Expenses a decrease of \$1,243,770.63, or 2.62%, with expenditures in the current year of \$384,851.89, incident to the flood. The extraordinary expenditures resulting from the flood amounted to \$2,532,486.44.

Hire of Freight Car charges show a reduction over the previous year of \$650,002.06. The average miles per car per day for 1927, was 38.80, compared with 39.66 in 1926, 37.22 in 1925, 33.02 in 1924 and 26.61 in 1923.

## Pension System

One hundred thirty-eight employees were retired in 1927 and fifty pensioned employees died during the year. Since the inauguration of the Pension System, July 1, 1917, seven hundred eighty-four employees have been retired, of whom one has returned to service. The total number of deaths to date, is two hundred seventy-three. At the close of the year, five hundred ten retired employees were receiving pensions, averaging \$59.45 per month, involving a monthly expenditure of \$30,318.50.

## Capital Stock

No changes have been made in the Capital Stock during the year.

## Funded Debt

Long Term Debt outstanding in the hands of the public increased \$5,333,340.

First and Refunding Mortgage 5% Bonds, Series F., to the amount of \$108,968,000 were issued during the year; \$95,000,000 were sold and \$13,968,000 placed in the Treasury.

First and Refunding Mortgage 6% Bonds, Series D., to the amount of \$28,683,000 and 6% Bonds, Series E., to the amount of \$25,000,000 were retired during the year.

Fifteen year 7% Sinking Fund Notes amounting to \$13,391,500 called for redemption January 17, 1927; Three year 5% Secured Gold Notes amounting to \$12,000,000 which matured July 1, 1927 and the 6% Notes issued to the United States Government aggregating \$8,309,760 were paid.

The issue of Series F. 5% Bonds to retire the Series D. & E. 6% bonds and the 6% Notes issued to the United States Government, effected a saving of \$573,312.60 in annual interest charges.

Equipment Trust Obligations amounting to \$2,282,400 matured and were paid during the year.

The Funded Debt Outstanding is shown on pages 14 to 16, inclusive of the report. Detailed description of the Mortgages will be found on pages 19 to 25, inclusive.

## New Lines

Construction of the Hot Springs Branch Extension, 12.19 miles, and the Nashville Branch Extension, 9.57 miles, was completed during the year. A spur 3.29 miles, extending from Tioga to Camp Beauregard, La., and 9.96 miles of track belonging to the Coal Belt Electric Railway Company, formerly operated under a trackage contract, were acquired by purchase and added to the owned mileage of the Company.

The lease of the Marion & Eastern Railroad, resulted in an increase of 6.96 miles to the operated mileage. The destruction of the Texas & Pacific Railway Company's bridge at Melville, La., during the flood, made it necessary to enter into trackage agreements with the Southern Pacific Company and the Gulf Coast Lines, for use of tracks between Bunkie and Livonia, La., increasing the mileage operated under trackage rights, 19.27 miles. The net increase in operated mileage was 48.37 miles.

[ADVERTISEMENT]



## Road and Equipment

The expenditures for the year include the construction of 24.12 miles of second main track between St. Louis and Cole Junction, Mo., also changes and additions to the automatic block system, reconstruction of bridges, changes in alignment and elimination of tunnels; installation of automatic block signals in Arkansas; enlargement of yard and terminal facilities at St. Louis, Mo., Poplar Bluff, Mo., Osawatomie, Kansas, and Texarkana, Ark.; raising of tracks and rebuilding of bridges at various points on the line. The construction of a twenty-two story office building in St. Louis, will be completed in 1928.

There was delivered and put into service during the year the following equipment:

5 Mountain Type Locomotives,
15 Switching Locomotives,
1 Consolidated Type Locomotive,
5 Steel Dining Cars,
3 Steel Cafe Club Cars,
10 Steel Coach - Baggage Cars,
6 Steel Mail-Baggage Cars,
10 Steel Coach-Baggage Cars,
10 Steel Coaches,
1165 Box Cars,
1250 Automobile Cars,
250 Steel Hopper Bottom Coal Cars,
250 Stock Cars,
2 Locomotive Cranes,
1 Ditcher,
2 Dump Cars,
2 Rail Unloaders,
1 Snow Plow,
6 Water Cars,
5 Boarding Cars,
1 Marine Pile Driver,
1 Steamboat Yawl.

The details of charges to Road and Equipment are shown on page 18 of the report a summary of which follows:

New Lines Constructed, .....	\$ 458,823.73
New Lines Purchased, .....	11,135.61
Second Main Track, .....	4,631,556.89
Road .....	\$12,439,925.66
Less Retirements, .....	272,227.06
	12,167,698.60
Equipment, .....	\$ 9,243,507.42
Less Retirements, .....	1,506,381.32
	7,737,126.10

Assets and Liabilities Not Appraised June 1, 1917 .....	Cr. 2,340,429.63
Total Charges to Road and Equipment....	\$22,665,911.30
By Order of the Board of Directors,	L.W. BALDWIN,
	President.

PROFIT AND LOSS  
December 31, 1927

Credit Balance, December 31, 1926,	\$50,082,183.36
Credit Balance Transferred from Income Account .....	4,401,196.28
Profit on Road Sold, .....	2,921.34
Unrefundable Overcharges, ....	11,518.54
Donations, .....	82,836.34
Miscellaneous Credits, .....	1,253,138.45
Less:	\$55,833,794.31
Surplus Appropriated for Investment in Physical Property, .....	\$ 82,836.34
Debt Discount Extinguished through Surplus .....	2,845,078.18
Loss on Retired Road, .....	247,225.38
Miscellaneous Debits .....	3,670,335.43
	6,845,475.33
Credit Balance, December 31, 1927,	\$48,988,318.98

[ADVERTISEMENT]

## Financial News

(Continued from page 991)

Selected items from the income statement follow:

NASHVILLE, CHATTANOOGA & ST. LOUIS		
	1927	1926
Average mileage operated .....	1,259.78	1,259.53
RAILWAY OPERATING REVENUES .....	\$22,905,626	\$24,023,878
Maintenance of equipment .....	3,124,693	3,499,473
Maintenance of way .....	4,885,192	5,001,608
Transportation .....	8,272,065	8,558,163
TOTAL OPERATING EXPENSES .....	18,282,454	18,992,860
Operating ratio .....	79.82	79.06
NET REVENUE FROM OPERATIONS .....	4,623,172	5,031,018
Railway tax accruals .....	960,997	1,075,000
Railway operating income .....	3,656,714	3,952,348
Equipment rents, dr. .....	32,878	114,767
Joint facility rents .....	217,426	130,574
NET RAILWAY OPERATING INCOME .....	3,841,261	4,018,155
Non-operating income .....	269,947	287,640
GROSS INCOME .....	4,111,208	4,305,796
Rent for leased roads .....	806,506	806,506
Interest on funded debt .....	904,875	917,876
TOTAL DEDUCTIONS FROM GROSS INCOME .....	1,785,387	1,794,538
NET INCOME .....	2,325,821	2,511,258

**NEW YORK, SUSQUEHANNA & WESTERN.**  
—Annual Report.—The annual report for 1927 shows a deficit after charges of \$629,335. The deficit in 1926 was \$206,365. Selected items from the income statement follow:

NEW YORK, SUSQUEHANNA & WESTERN		
	1927	1926
RAILWAY OPERATING REVENUES .....	\$5,199,137	\$5,395,850
Maintenance of way .....	790,695	755,306
Maintenance of equipment .....	850,410	896,075
Transportation .....	2,651,519	2,533,563
TOTAL OPERATING EXPENSES .....	4,511,091	4,399,144
Operating ratio .....	86.77	81.53
NET REVENUE FROM OPERATIONS .....	688,045	996,706
Railway tax accruals .....	345,712	332,049
Railway operating income .....	341,305	664,273
Equipment rents, dr. .....	13,803	22,252
Joint facility rents, dr. .....	70,188	56,453
NET RAILWAY OPERATING INCOME .....	102,620	550,709
Non-operating income .....	75,129	62,699
GROSS INCOME .....	177,749	613,408
Rent for leased roads .....	24,128	24,117
TOTAL DEDUCTIONS FROM GROSS INCOME .....	807,085	819,773
Deficit for year carried to profit and loss .....	629,335	206,365

**NORFOLK SOUTHERN.**—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$740,355 as compared with \$813,578 in 1926. Selected items from the income statement follow:

NORFOLK SOUTHERN		
	1927	1926
Average mileage operated .....	931.78	931.88
RAILWAY OPERATING REVENUES .....	\$9,567,021	\$10,066,487
Maintenance of way .....	1,202,581	1,327,276

Maintenance of equipment .....	1,483,413	1,672,702
Transportation .....	3,570,917	3,499,543
TOTAL OPERATING EXPENSES .....	6,827,969	7,137,700
Operating ratio .....	71.37	70.91
NET REVENUE FROM OPERATIONS .....	2,739,053	2,928,787
Railway tax accruals .....	643,161	671,864
Railway operating income .....	2,093,047	2,252,191
Equipment rents, dr. .....	353,782	443,894
Joint facility rents, dr. .....	21,082	22,210
NET RAILWAY OPERATING INCOME .....	1,718,182	1,786,087
GROSS INCOME .....	2,179,888	2,332,100
Rent for leased roads .....	167,102	167,102
Interest on funded debt .....	843,099	851,219
TOTAL DEDUCTIONS FROM GROSS INCOME .....	1,439,533	1,518,523
NET INCOME .....	740,355	813,578

**PENNSYLVANIA—Bonds.**—The Interstate Commerce Commission has authorized the Cleveland & Pittsburgh to issue \$4,897,000 general and refunding 4½ per cent bonds, series A, to be delivered to the Pennsylvania at par in reimbursement for indebtedness, the Pennsylvania to assume liability as lessee and guarantor in respect to these bonds.

**PENNSYLVANIA.—Stock Issue Approved.**—Division 4 of the Interstate Commerce Commission on April 24 approved a report and order authorizing this company to issue \$62,408,250 of additional stock to be offered to the stockholders of record on April 14 at par.

**PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.**—*Increased Indebtedness Authorized.*—The stockholders of this company at their annual meeting authorized an increase of the indebtedness of the company over and above the amount heretofore authorized and now available, to the extent of \$25,000,000; and approved the purchase of the properties and franchises of the former Cincinnati, Richmond & Fort Wayne extending from a connection with this company's railroad at Richmond, Ind., to a connection with the Pittsburgh, Fort Wayne & Chicago at Adams, Ind., 85.67 miles.

**SEABOARD AIR LINE.**—*Equipment Trust Certificates.*—This company has filed with the Interstate Commerce Commission a supplement to its application for authority to assume obligation and liability for \$740,625 of equipment trust certificates and \$246,875 of deferred certificates, in connection with the acquisition of 25 switching locomotives. The company now asks authority for \$1,200,000 of first lien equipment trust certificates at 4½ per cent and \$420,000 of second lien 5 per cent certificates, so as to cover in addition 11 gas-electric passenger motor cars and 12 trailers.

**ST. LOUIS-SAN FRANCISCO.**—See Kansas City, Fort Scott & Memphis.

**SUPERIOR & SOUTH EASTERN.**—*Authorized to Operate Railroad.*—The Interstate Commerce Commission has authorized this company to operate over a railroad extending from Loretta, Mich., southward 22 miles with a two-mile branch. The railroad has made a track-lease contract with a lumber company owning the line, purposing to convert a logging road into a common carrier.

**THE LOUISIANA RAILWAY & NAVIGATION.**—*Merger.*—This company and the Louisiana & Arkansas are planning to apply to the Interstate Commerce Commission for permission to merge the two properties. It is also planned to spend \$3,000,000 in improving the physical condition of the Louisiana Railway & Navigation Company.

**TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.**—*New Director.*—E. M. Durham, Jr., senior vice-president of the Missouri Pacific, was elected a director on April 9 to succeed W. G. Vollmer, assistant to the president of the Missouri Pacific, who represented that company on the board.

**UNION PACIFIC.**—*Annual Report.*—An abstract of the annual report of this company appears on adjacent advertising pages.

**WESTERN MARYLAND.**—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of \$3,275,078 as compared with net income in 1926 of \$3,259,339. Selected items from the income statement follow:

WESTERN MARYLAND		
	1927	1926
Average mileage operated .....	804.44	804.44
RAILWAY OPERATING REVENUES .....	\$21,866,171	\$25,259,575

Maintenance of way	3,289,672	2,952,965
Maintenance of equipment .....	4,552,230	6,098,196
Transportation .....	6,076,838	7,276,518
<b>TOTAL OPERATING EXPENSES .....</b>	<b>14,993,312</b>	<b>17,404,633</b>
Operating ratio .....	68.57	68.90
<b>NET REVENUE FROM OPERATIONS .....</b>	<b>6,872,858</b>	<b>7,854,942</b>
Railway tax accruals .....	1,180,026	1,096,082
Railway operating income .....	5,691,734	6,758,125
Equipment rents, net .....	632,743	dr. 489,158
Joint facility rents, .....	192,884	193,744
<b>NET RAILWAY OPERATING INCOME .....</b>	<b>6,131,593</b>	<b>6,075,223</b>
Non-operating income .....	207,656	188,664
<b>GROSS INCOME .....</b>	<b>6,339,249</b>	<b>6,263,887</b>
Rent for leased roads .....	85,130	65,130
Interest on funded debt .....	2,590,931	2,599,985
<b>TOTAL DEDUCTIONS FROM GROSS INCOME .....</b>	<b>3,064,171</b>	<b>3,004,548</b>
<b>NET INCOME .....</b>	<b>3,275,078</b>	<b>3,259,339</b>

**WESTERN PACIFIC.**—*Extension.*—Examiner Sullivan has recommended to the Interstate Commerce Commission that this company be authorized to construct a 6,200-ft. line at Wells, Nev., connecting its main line with a branch of the Oregon Short Line.

**YANKTON, NORFOLK & SOUTHERN.**—*Articles of Incorporation Filed.*—Articles of incorporation have been filed with state officers of South Dakota at Pierre, S. D., for the construction of a railroad between Yankton, S. D., and Norfolk, Neb., a distance of about 66 miles. The cost of construction is estimated at \$1,250,000. The incorporators are: T. J. Frick, Harold Doyle and E. A. Bruce of Yankton, Charles Ruden of Crofton, Neb., and August Danielson of Wausa, Neb.

### Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes as of the respective valuation dates as follows:

Cincinnati, Indianapolis & Western .....	\$11,850,000	1918
Louisiana & North West .....	1,526,820	1918
Winona Bridge .....	222,000	1918
Sibley, Lake Bistenau & Southern .....	227,662	1916
Woodworth & Louisiana Central .....	50,278	1916
Louisiana & Pacific .....	363,228	1916
Buffalo Creek .....	77,110	1917
(used but not owned \$3,585,000)		

### Dividends Declared

Georgia, Southern & Florida.—First and second preferred, 2½ per cent, payable May 24 to holders of record May 10.

Illinois Central.—1¼ per cent, quarterly, payable June 1 to holders of record May 4.

International Railways of Central America.—Preferred, 1¼ per cent, quarterly, payable May 15 to holders of record April 30.

Norfolk & Western.—\$2.00, quarterly, payable June 10 to holders of record May 31.

Pullman, Inc.—\$1.00, quarterly, payable May 15 to holders of record April 28.

Lehigh & Hudson River ...\$5,175,000 1918

Monongahela Connecting ... 3,485,856 1919

La Salle & Bureau County 142,500 1917

### Average Price of Stocks and of Bonds

	Last week	Last year
Average price of 20 representative railway stocks ..	121.87	121.94 110.55

## Officers

### Executive

**J. E. Taussig**, president of the Wabash has in addition been elected president of the Des Moines Union, succeeding **J. T. Gillick**, vice-president of the Chicago, Milwaukee, St. Paul & Pacific, who has been elected in addition vice-president of the Des Moines Union. Mr. Gillick replaces Mr. Taussig as vice-president.

The Oregon, California & Eastern, following the taking over of its operation jointly by the Great Northern and the Southern Pacific, elected the following officers on April 6: **Thomas Ahern**, president, in addition to his duties as assistant general manager of the Southern Pacific, with headquarters at Sacramento, Cal.; **J. H. O'Neill**, vice-president, in addition to his duties as general manager of the Western Lines of the Great Northern, with headquarters at Seattle, Wash.; **N. H. Bogue**, general manager and chief engineer, with headquarters at Klamath Falls, Que.; **J. Wagner**, auditor and secretary with headquarters at Klamath Falls, Ore.; **Pearle Collister**, treasurer, with headquarters at Klamath Falls; **A. A. Hampson**, assistant secretary and assistant treasurer, with headquarters at Portland, Ore.

### Financial, Legal and Accounting

**W. A. Hannen** has been elected treasurer of the Des Moines Union, with headquarters at Des Moines, Iowa, succeeding **C. H. Hueston**, deceased.

**William H. Dewey**, auditor of equipment service accounts of the Southern Pacific at San Francisco, Cal., since 1910, retired under the pension rules of the company on April 1.

**F. C. Keith**, assistant auditor of expenditures of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been promoted to assistant auditor of miscellaneous accounts, with headquarters at the same point. **W. S. Pringle** has been appointed assistant auditor of expenditures to succeed Mr. Keith.

### Operating

**M. J. McHugh**, road foreman of engines on the Peru division of the Wabash at Peru, Ind., has been appointed trainmaster on the Chicago Terminal division, with headquarters at Chicago.

**George F. Squires**, assistant freight traffic manager of the Pacific Electric, with headquarters at Los Angeles, Cal., has been appointed general manager of the Harbor Belt Line Railroad of Los Angeles.



T. R. Beach has been appointed acting trainmaster of the Springfield district of the Illinois Central, with headquarters at Clinton, Ill., replacing Frank Walker, who has been granted a leave of absence to serve as superintendent of the Litchfield & Madison, with headquarters at Edwardsville, Ill. Mr. Walker temporarily succeeds C. E. Bickel, who has been granted a leave of absence by the Litchfield & Madison on account of sickness.

Carey J. Millis, assistant to the president of the Southern Pacific at San Francisco, Cal., from 1912, to 1918 will retire under the pension rules of that company on May 1 at the age of 70 years. More recently Mr. Millis has been manager of the pass bureau of the Southern Pacific. His railroad service has covered a period of 50 years, starting in 1878 when he entered the employ of the Tioga & Elmira Short Line (now part of the Erie) as general office boy at Elmira, N. Y. Included in his railroad career is service in the traffic departments of the Rio Grande Western (now the Denver & Rio Grande Western), the Oregon Short Line and the Oregon Railroad & Navigation Company (now the Oregon-Washington Railroad & Navigation Company). From 1907 to 1912 Mr. Millis was vice-president and general manager of the Harriman Coos Bay Lines (now a part of the Southern Pacific) at Marshfield, Ore.

William N. Neff, who has been appointed general superintendent of the Northwestern Pacific, with headquarters



William N. Neff

at Sausalito, Cal., has been in railway service in the west for more than 38 years. He was born on April 11, 1874, at Lawrence, Kan., and at the age of 15 years became a warehouseman on the Missouri Pacific. During the following six years he was advanced successively to telegraph operator, agent, clerk to the roadmaster and chief clerk to the division superintendent, becoming a telegraph operator on the Great Northern in September, 1895. He also served on the Great Northern as chief clerk to the superintendent, chief clerk to the

general superintendent and in 1899 was advanced to assistant superintendent at Kalispell, Mont. From 1900 to 1914, Mr. Neff was successively superintendent on the St. Louis Southwestern at Pine Bluff, Ark., superintendent of the St. Louis Southwestern of Texas at Mt. Pleasant, Tex., general superintendent of the St. Louis Southwestern at Tyler, Tex., and vice-president and general superintendent of the St. Louis Southwestern of Texas at the same point. During the period from 1914 to 1917 he served as superintendent of the Northwestern Pacific at San Francisco, Cal., and he then returned to the Cotton Belt as vice-president and general manager, with headquarters at Tyler. During federal control of the railroads, Mr. Neff was first general manager of the Cotton Belt, the Louisiana & Arkansas and the Illinois Lines of the Missouri Pacific, and later, federal manager of the Cotton Belt and the L. & A. In April, 1920, he was appointed chairman of the Southwestern Railway Executives' Association at St. Louis, an association formed by the presidents of the Southwestern Lines in the period immediately following federal control. His work with this group was completed in July, 1922, and he then became president of the Cia Internacional de Productos, with headquarters at Asuncion, Paraguay. After a year with this company he returned to the United States and in July, 1924, he was appointed superintendent of the Pueblo division of the Denver & Rio Grande Western, with headquarters at Pueblo, Colo. His appointment as general superintendent of the Northwestern Pacific in charge of operation and maintenance of way and structures became effective on March 28.



John H. Rees

Marie, with headquarters at Minneapolis, Minn., has been in the service of that railway for more than 39 years. He was

born at Eden Prairie, Minn., on September 23, 1869, and first entered railway service in 1887 with the Minneapolis Union (now a part of the Great Northern). On March 4, 1889, Mr. Rees entered the service of the Soo Line, holding various minor positions in the traffic department until his advancement to chief of the tariff bureau of that railroad on May 4, 1909. Seven years later, on April 15, 1916, he was promoted to assistant general freight agent, with headquarters at Minneapolis. Mr. Rees' promotion to general freight agent became effective on April 2.

## Mechanical

Thomas J. Cutler, who retired on March 15 as mechanical superintendent of the Eastern Lines of the Northern Pacific, with headquarters at St. Paul, Minn., completed on that date nearly 30 years of service in the mechanical department of that railroad. Mr. Cutler was born on April 13, 1866, at Lewistown, Pa., and entered railway service on October 12, 1895, as a machinist on the Minnesota & International. Previous to his first entry into railroad



Thomas J. Cutler

service he had been employed by the Standard Steel Works Company and the Logan Iron & Steel Co., at Burnham, Pa. Mr. Cutler entered the service of the Northern Pacific in September 1898, as a machinist at Livingston, Mont., where he remained until December, 1902, when he was advanced to general foreman at Mandan, N. D. In June of the following year he was promoted to master mechanic and for the next 15 years he served in that capacity at Glendive, Mont., at Missoula and at Spokane, Wash. Mr. Cutler was promoted to general master mechanic, with headquarters at St. Paul, in November, 1918, being transferred to Livingston in April, 1919. He was promoted to mechanical superintendent of the Eastern Lines of the Northern Pacific in June, 1923.

## Traffic

John H. Rees, who has been promoted to general freight agent of the Minneapolis, St. Paul & Sault Ste.

## Purchases and Stores

**J. Herbert James**, secretary and chief clerk to the vice-president of the Pittsburgh & Lake Erie, with headquarters at Pittsburgh, Pa., has been appointed purchasing agent, with headquarters at the same point, succeeding C. M. Yohe, promoted. Mr. James was born at



J. Herbert James

Pittsburgh, Pa., on May 23, 1886, and entered the service of the Pittsburgh & Lake Erie on January 1, 1906, as a stenographer in the engineering department. On June 8, 1910, he was transferred to the operating department and on February 16, 1916, he was appointed chief clerk to the general manager. During the period of federal control Mr. James served as chief clerk to the federal manager and upon the termination of government ownership he was appointed secretary and chief clerk to the vice-president, serving in this capacity until his recent appointment as purchasing agent.

**John E. McMahon**, who has been promoted to assistant purchasing agent and general storekeeper of the Chicago, St.



John E. McMahon

Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has been in the service of that railroad for more than 20 years. He was born on May 22, 1884, at Hudson, Wis., and first en-

tered railway service on September 3, 1902, as a laborer in the Omaha shops at Hudson. Later he was a pipe fitter and then a carpenter and after leaving the railroad to study stenography he returned to the Omaha on December 1, 1908, as a clerk in the office of the master car builder. In the following year Mr. McMahon was transferred to the office of the storekeeper at St. Paul as a stenographer and on August 15, 1913, he was advanced to storekeeper at that point. From June 27, 1916, to December 15, 1918, he served as chief clerk in the purchasing office and he was then promoted to general storekeeper. Mr. McMahon's promotion to assistant purchasing agent and general storekeeper became effective on March 1.

## Obituary

**James C. Fitzgerald**, general agent for the Chicago, Milwaukee, St. Paul & Pacific at Denver, Colo., since 1924, died in that city on April 20 after an illness of two weeks.

**William J. Gooding**, division engineer on the Seaboard Air Line, with headquarters at Charleston, S. C., died in that city on April 17. Mr. Gooding had been in the service of the Seaboard Air Line for more than 25 years.

**Gilbert F. Titus**, assistant to the president of the Illinois Central from 1907 to 1911, and previous to that time, local treasurer, at Chicago, died at Pittsfield, Mass., April 18. At the time of his death, Mr. Titus was treasurer of the Berkshire Life Insurance Company.

**Harry J. Skinner**, superintendent of bridges of the Spokane Falls & Northern (now part of the Great Northern), with headquarters at Spokane, Wash., from 1890 to 1896, died in that city on April 13. Since 1900 Mr. Skinner had been engaged in railroad contracting business, specializing in the construction of bridges.

**Robert I. Bodkin**, assistant general freight claims agent of the Canadian Pacific with headquarters at Winnipeg, Man., died following a stroke of apoplexy, on April 17, while visiting at Prud'homme, Sask. Mr. Bodkin was 55 years of age and was promoted to assistant general freight agent in December, 1927.

**Henry Root**, who surveyed the first railroad line into Oakland, Cal., from Sacramento in 1869 as engineer in charge for the Central Pacific (now part of the Southern Pacific) and who in 1873 was in charge of the construction of the Central Pacific bridge across the Estuary between Oakland and Alameda, died at Oakland on February 23. Mr. Root also served as engineer in charge of the construction of Central Pacific terminals at Oakland and San Francisco.

**Stephen H. Brown**, from 1918 to 1926 assistant general superintendent of transportation of the Great Northern at St. Paul, Minn., died March 9 at Spokane,

Wash. He was born February 9, 1866, at St. John, New Brunswick, and began railroad work at the age of 19 on the Boston & Maine, where he became a train dispatcher. Following that he was in the service of the Chicago, Burlington & Quincy, the Chicago & Alton, and the Delaware, Lackawanna & Western before going to the Great Northern in 1910.

**H. C. Sanford**, chief engineer of the Rosoff Subway Construction Company, and formerly a civil engineer on several railroad construction projects, died at his home in Englewood, N. J., on April 22, following an illness of pneumonia. Mr. Sanford was born in Canton, O., in 1869, and received his early experience as a railroad telegraph operator, draftsman and engineer. About 1890 he began civil engineering work which led to his taking part in a number of engineering projects throughout the east and central west. At the time of his death, he was engaged on a subway project in New York City.

The more important railroad work with which he was connected in recent years includes the electrification of the Virginian and the construction of the Baltimore & Ohio tunnel under the city of Baltimore.

**Frederick G. Prest**, former director of purchases of the Northern Pacific, who died at St. Paul, Minn., on March 30, had been associated with the purchasing department of that railroad for 44 years. He was born on January 5, 1854, at Queenston, Ont., and entered railway service as a clerk in the purchasing department of the Northern Pacific in 1880. In 1882, Mr. Prest was advanced to chief clerk of that depart-



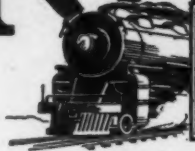
Frederick G. Prest

ment at St. Paul, being promoted to assistant purchasing agent, with headquarters at the same point, nine years later. He was further promoted to purchasing agent in 1896, remaining in that position for 25 years, until his promotion to director of purchases in November, 1921. Mr. Prest retired as director of purchases in September, 1924.



Two Sections—Section Two

# Railway Age



**Motor Transport Section**

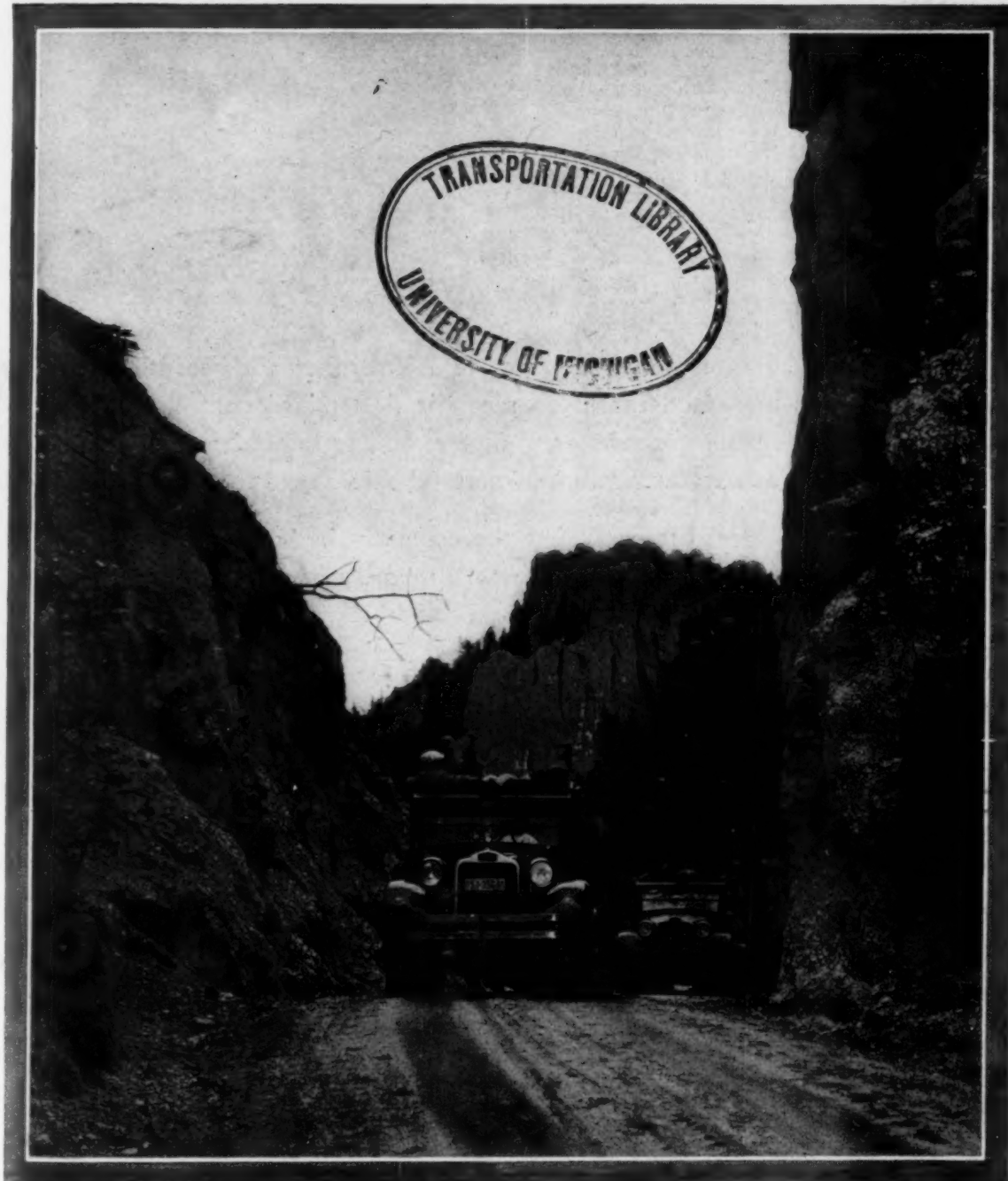
*Devoted to the  
Co-ordination of Railway and Highway Service*



FIRST HALF OF 1928—No. 17

APRIL 28, 1928

SEVENTY-THIRD YEAR



## ***Articles in This Issue:***

**Union Pacific Motor Coaches Supplement Train Service**

**Reading Begins Highway Operation**

**The Outlook for Regulation**



## Out of the *accessory* class

Westinghouse Automotive Air Brakes are becoming more and more the recognized standard control for modern, heavy duty motor vehicles. Modern usage and traffic conditions demand Air Brakes.

Operators, realizing the economy in larger, heavier loads, have been quick to recognize the advantages of Air Brake controlled units and are repeatedly writing Westinghouse in their specifications. Adequate control on grades, emergency stop possibilities, and ability to hold position in traffic lanes, not to mention the relief from driver fatigue, have stamped Westinghouse as the modern brake for modern motor vehicles—no longer an accessory but a necessity.



Westinghouse Automotive Air Brakes have been adopted as standard equipment by leading manufacturers.

*Thorough and competent, Westinghouse engineering service is available to the operator without obligation—of course.*

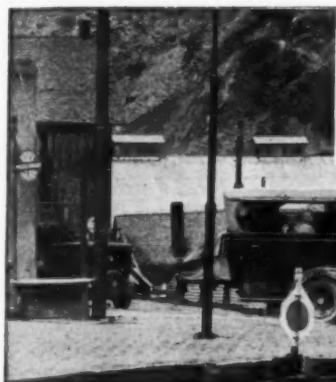
**WESTINGHOUSE AIR BRAKE COMPANY  
AUTOMOTIVE DIVISION, WILMERDING, PA.**

6215

# WESTINGHOUSE

## AUTOMOTIVE AIR BRAKES





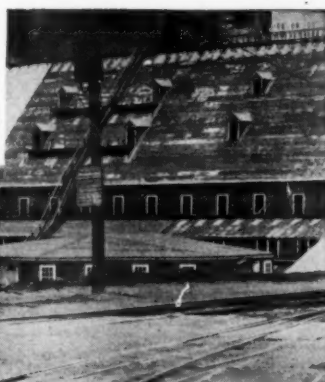
# Railway Age

Motor Transport Section  
*Dedicated to the  
Co-ordination of Railway and Highway Service*

Vol. 84,

April 28, 1928

No. 17



## Contents

### Union Pacific Motor Coaches Supplement Train Service 1007

Company's subsidiary, the Union Pacific Stages, Inc., operates between Portland, Ore., and Walla Walla, Wash.—Train service reduced over this route.

### Reading Begins Highway Operation 1012

Subsidiary of Reading Railway, after two years of planning, finally wins highway certificates and prepares to begin operation on April 29 —Several new routes a month hence.

### The Outlook for Regulation 1015

New Parker bill introduced and hearings held—Support almost unanimous except for N. A. C. C.—Interstate Commerce Commission presents recommendations, supporting Flynn report.

#### EDITORIALS

Airplanes and Motor Coaches .....	1005
Atlantic City Meeting of the Motor Transport Division .....	1005
The Advantages of Railway-subsidary Co-operation .....	1005
Fate of Proposed Federal Legislation in Doubt .....	1006
Wherein Railways Excel as Motor Vehicle Operators .....	1006

#### GENERAL ARTICLES

Union Pacific Motor Coaches Supplement Train Service .....	1007
An Automatic Inflator .....	1011
Reading Begins Highway Operation .....	1012

#### GENERAL ARTICLES—Continued

The Outlook for Regulation .....	1015
Propose Uniform Motor Coach Code .....	1018
White High-Speed Heavy Duty Motor Truck Chassis .....	1020
Motor Coach With Gas-Electric Drive .....	1021
Central of Georgia Designs Combination Motor Coach and Truck .....	1022
A New Timken Worm Drive Rear Axle ....	1023
Electric Brakes for Automotive Equipment ..	1024
The Trend in Passenger Travel .....	1025
Co-ordinating Railway and Motor Coach Activities .....	1027

#### MOTOR TRANSPORT NEWS 1028

*The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)*

It  
costs money  
to guess!



Consult those  
who have compared

---



# Railway Age

## Motor Transport Section

Devoted to the  
Co-ordination of Railway and Highway Service

Vol. 84, No. 17

April 28, 1928

Table of Contents Appears on  
Page 75 of Advertising Section

### *Airplanes and Motor Coaches*

**W**HAT lies ahead in competition for passenger business may or may not be indicated by the beginning or projected beginning of airplane operations by several of the larger independent companies operating motor coaches. One company, the Yelloway lines, recently announced that it was considering the installation of two passenger-carrying airplane routes this summer between Kansas City and New York, one running via Chicago, Cleveland and Buffalo and the other via St. Louis, Cincinnati, Pittsburgh and Philadelphia. It is quite possible that this announcement, as well as some others of the same sort on the part of other independent motor coach operators, was merely an attempt to secure publicity and does not mean that actual airplane operation will be undertaken as scheduled. On the other hand, one large motor coach operator on the Pacific coast owns an air transport line which is actually operating. This company is the Pickwick Stages system, which, through a subsidiary, operates airplanes between San Francisco and Portland, and has plans for other lines. Just what significance lies in this is a question. The prospect of large air transportation systems operated by the motor coach companies and aided by feeder routes on the highways is rather interesting and worth some thought.

### *Atlantic City Meeting of Motor Transport Division*

**P**REPARATIONS for the meeting of the newly organized Motor Transport Division of the American Railway Association, to be held at Atlantic City on June 21-23, are going forward at a good rate. The committees of the division are being organized by the leaders of the various sections and the work of preparing reports for presentation is well under way. A large and comprehensive exhibit of motor coaches, motor trucks and other automotive equipment is also assured by the heavy demand from the manufacturers of such equipment for exhibit space in Marine Hall, where the equipment will be displayed. Advance indications are that the attendance at the meeting of the division will be large, probably much larger than that at any previous meeting of the division or of its predecessor, the Railroad Motor Transport Conference. Almost without exception, the officers in charge of railway motor coach and motor truck operations have expressed the intention to attend the meeting. All this makes the future of the

division look bright. It is probably unfortunate that the division was not organized and active sooner, but enthusiasm and hard work on the part of its membership will readily overcome this handicap. It has been said before, but it may as well be said again, that the division has important work ahead of it. It is generally recognized that the co-ordination of railway transportation with highway transportation, and even air transportation, is one of the foremost problems faced by the railways at this time. The Motor Transport Division has an opportunity, which it recognizes, to facilitate the solution of this problem. The importance of the work of the division justifies the attendance at its first regular meeting, that at Atlantic City in June, of representatives of every railway.

### *The Advantages of Railway- Subsidiary Co-operation*

**T**HE railways have one great advantage as operators of motor coaches and motor trucks. This advantage lies in their ability to reduce the expenses of their highway operations by eliminating some of the departments which an independent highway operator has to maintain, and by providing for the carrying on of the work of such departments in existing departments of the railways. In most instances, the railway departments can carry on such work for the highway subsidiary without additional expense, or if any additional expense is involved it is much less than would be incurred if the subsidiary were to set up a complete organization of its own. In carrying out this idea of co-ordinating the activities of the railways and their highway subsidiaries, many of the lines operating motor vehicles arrange for their own purchasing, accounting and traffic departments to take over the work of these kinds for their subsidiaries. In some instances, even the operation and the maintenance of the motor vehicles are supervised directly by the operating and mechanical officers of the railways. In these cases the costs of motor coach and motor truck operations are held at the very minimum. Railways whose highway subsidiaries are still small will probably find it advantageous to pursue this plan to reduce expenses. As the highway activities of a railway expand, however, the money-saving possibilities diminish, since the work, such as accounting and traffic, which must be done for the subsidiary, becomes sufficient to justify its handling by separate offices. Even among the largest railway operators of motor vehicles, however, opportu-

ity exists for advantageous co-operation between the various departments of the railways and their subsidiaries. The primary purpose of railways operating motor vehicles is to utilize their advantages, both to themselves and to their patrons, in order that they may provide the best and most economical transportation possible. To accomplish this aim it has been found generally advisable to carry the plan of co-ordination beyond the mere train and motor coach schedules into the activities of the two organizations themselves.

## Fate of Proposed Federal Legislation in Doubt

THE outlook for the passage of legislation, in this session of Congress, which would subject common carrier motor coaches operating interstate to regulation by federal authority does not appear any too bright at this time, although the Interstate Commerce Commission's report, made public on April 21, may have some effect. It has been practically taken for granted, for a number of months, that there was little possibility of legislation affecting interstate motor trucks during the present session, but there were some hopes that immediate action might be taken to regulate the interstate passenger carriers.

This expectation was materially strengthened a few weeks ago by the introduction in Congress by Representative Parker of a compromise bill which was understood to have the support of the American Automobile Association, the American Electric Railway Association, and the National Association of Railroad and Public Utilities Commissioners, as well as the Association of Railway Executives. The indicated support of these organizations, representing as they do virtually all the parties who would be affected by the passage of such legislation, including the public (as represented by the state commissioners) as well as the operators of motor coaches, seemed to give assurance that the bill would be passed in Congress with a minimum of opposition.

When hearings on the bill began, however, it quickly developed that some of the organizations supporting the bill had certain reservations in mind which precluded their whole-hearted support of the bill in its existing form. It developed also that the National Automobile Chamber of Commerce, representing the manufacturers of motor coaches, had not participated in the drawing up of the bill, and representatives of this organization appeared at the hearings to testify in opposition to many of its features. Even the supporters of the new Parker bill proposed various changes in it which, opposed by other of the organizations, had the effect of weakening to some extent their joint advocacy of it.

The situation at the present time seems to be this: All of the organizations involved have declared themselves in favor of regulation of interstate common carrier motor coaches, but they are in disagreement as to the exact nature of such regulation. The uniformly expressed desire for regulation on the part of all responsible parties interested in the proposed legislation should be sufficient to overcome the existing obstacles in the path of federal regulation of motor coaches, however large they may be, but the time for the adjournment of Congress is rapidly approaching and this fact makes it

difficult to hope very confidently for an agreement in Congress on a bill as to which there is still so much controversy over details.

The fact that the Interstate Commerce Commission has now issued its report on the subject, which it had been hoped would be ready for presentation at the beginning instead of at the end of the congressional session, may help to crystallize opinion among the members of the House committee that are now working on the bill, and the fact that the commission has so nearly unanimously backed up the recommendations of Attorney-Examiner Flynn may have some influence, as it is somewhat unusual of late for the commissioners to find themselves in agreement on a subject of such importance. However, it is to be remembered that the kind of regulatory laws we have had in the past have resulted from a public demand for restrictive or punitive regulation, and that it is not so easy to arouse Congress to the need for constructive legislation when the demand is presented by those who are to be regulated and those that propose to do the regulating.

## Wherein Railways Excel as Motor Vehicle Operators

WHEN a driver of a motor vehicle is alone or has two or three friends with him, the restrictions placed upon him for his own safety need not be the most severe. If he wants to risk his own life by driving recklessly, society is concerned to be sure, but not to the same extent as if he had 30 paying passengers. In the latter case society not only has the right, but the positive duty to do what it can to see that the driver shall put the safety of passengers above every other consideration. The motor coach driver who is graduated into that position from a motor truck or a private automobile does not always immediately understand the new concept of a driver's duties. Often, as far as the smaller independent motor coach lines are concerned, his employers themselves are not as emphatic about the matter as they might well be. In such a situation the railroad organization has a tremendous advantage by reason of long years of experience as a reliable public servant.

Most all railroad motor coach organizations have worked out detailed rules for their drivers and other employees, and they are sufficiently acquainted with management technique to know how to secure obedience to these rules. One railroad highway company in selecting its employees presents them with a copy of its operating rules and then requires them to take a written examination on the subject before it allows them to begin work. This examination is complete, i.e., there is a question covering each rule, and 100 per cent perfection in replies is demanded. When the applicant turns in his examination paper, it is placed in his personal record file. In no case which may occur thereafter will a driver be able to plead ignorance or misunderstanding of the rules as an excuse in the event that he is involved in an accident. The knowledge of this without doubt exercises a wholesome restraining influence on any momentary impulse toward recklessness. Such precautions for the safety of patrons on the part of the operating company gives further evidence of the pre-eminent fitness of established transportation companies to engage in the newer forms of the business.





The Union Pacific Has Three A. C. F. Motor Coaches

## Union Pacific Motor Coaches Supplement Train Service

*Subsidiary, Union Pacific Stages, Inc., operates between  
Portland, Ore., and Walla Walla, Wash.—  
Train service reduced*

THE UNION PACIFIC Stages, a subsidiary of the Union Pacific System and the Oregon-Washington Railroad & Navigation Company, has been operating between Portland, Ore., and Pendleton, a distance of 231 miles, on a two round trip per day schedule since July 1, 1927. Prior to that time, the O. W. R. & N. had operated a motor coach between Pendleton and Walla Walla, Wash., a distance of 46 miles, about two years. Between Pendleton and Walla Walla the motor coach operation replaces all but one passenger train a day. Between Portland and Pendleton, however, the motor coach operation is largely of a supplementary character, although one local train, which made a round trip between The Dalles and Pendleton daily, has been discontinued, effecting a reduction in train costs of approximately \$4,400 per month.

The highway traversed by the Union Pacific motor coaches between Portland and Pendleton is the Columbia river highway and the Old Oregon trail, generally conceded to be one of the most scenic highways in the world. For almost the entire distance the road parallels the Columbia river, passing close by Multnomah Falls, Mount Hood, and numerous other points of great scenic interest.

The officers of the Union Pacific Stages are for the most part officers also of the Oregon-Washington Railroad & Navigation Company. J. P. O'Brien, general manager of the railway, is president of the motor coach subsidiary. The only officer who has duties solely in connection with the Union Pacific Stages is

the superintendent, Carl Beach, whose headquarters are at Pendleton.

Holder of railway tickets between points served by the motor coach lines may use either train or motor coach, such tickets being honored on the latter, but motor coach tickets are not honored on trains except in emergency. Holders of inter-line tickets to or from points between The Dalles and Pendleton are privileged to ride in the motor coaches if they desire. Inter-line tickets routed via Portland where the starting point or destination is not on the Oregon-Washington Railroad & Navigation Company, and inter-line and intra-system railway tickets routed via Huntington or Spokane, Wash., where the destination or point of origin is west of The Dalles, are not honored on the motor coaches, however. All inter-line, intra-system and local railway tickets, are honored on the motor coach between Pendleton and Walla Walla, where passenger train service has been almost completely replaced by motor coach service.

One way fares on the motor coaches are approximately the same as one way fares on the railway, but in common with the custom of other western motor coach companies, reductions are made on round trip fares on the motor coaches. The round trip fares on the motor coaches amount to one and one-half times the one way fares. The fares include the free transportation of hand baggage not to exceed 70 lb. for each full fare. The baggage is usually handled inside the motor coaches at the rear, although all of the coaches

The Union Pacific motor coaches also handle package shipments between points in the state of Oregon and between Oregon and Washington points, but not locally in the state of Washington. For packages weighing up to three pounds, the charge is 25 cents to 40 cents depending on the mileage; for packages weighing from three to five pounds the charge is 25 cents to 50 cents; for packages weighing from six to ten pounds, the

### Driver's Defect Report—Front Side

## Six Motor Coaches Operated

Six motor coaches are operated by the Union Pacific Stages, four of these being assigned regularly to the Portland-Pendleton line, one being assigned regularly to the Pendleton-Walla Walla line, and one being held in reserve. The car used regularly between Pendleton and Walla Walla is a model 50-A White motor coach which has been in service since August, 1925. This coach was rebuilt after it had covered 161,000 miles. The other equipment, purchased by the Union Pacific Stages at the time it began the operation of the Port-

### Reverse Side of Driver's Defect Report on Which Mechanic Makes Notations

land-Pendleton line, consists of five parlor-type motor coaches, three of these being Model-L A. C. F. motor coaches and two Model-AL Mack motor coaches. The

The parlor-type seats in the motor coaches are upholstered in blue mohair. Partly on account of the light traffic which has been handled on the motor coaches and partly because the coaches are taxed in Oregon on the basis of their seating capacity, the four rear seats in each of the coaches have been removed. This allows an extra large space for express and baggage inside the coaches.

The company has six regular coach drivers, four of these being assigned to the Portland run out of Pendleton, one to the Walla Walla run, and one to the relief

## Package Report

The driver between Pendleton and Walla Walla, a 46-mile run, makes two trips each way a day, leaving Walla Walla at 7:20 a.m. and arriving at Pendleton at 9:15 a.m.; leaving Pendleton at 11:30 a.m., and arriving at Walla Walla at 1:30 p.m.; leaving Walla Walla at 2:30 p.m. and arriving at Pendleton at 4:25 p.m.; and leaving Pendleton at 5:05 p.m. and arriving at Walla Walla to tie up for the night at 7:10 p.m. The four regular drivers on the Portland-Pendleton line each make one trip, a total of 231 miles, daily. Thus, the driver on the first morning run out of Pendleton leaves



that point at 8 a.m. and arrives at Portland at 5:45 p.m. He returns to Pendleton on the first westbound run the following day, leaving Portland at 7:10 a.m. and arriving at Pendleton at 4:30 p.m. The driver on the second morning run out of Pendleton, leaving at 9:30 a.m. arrives at Portland at 7:10 p.m. and remains there until

All of the drivers employed by the Union Pacific Stages were selected for their experience as motor coach operators.

Form	
UNION PACIFIC STAGES, INC.	
REPORT OF TIRE CHANGE	
Date _____ 192__	Time _____ AM PM
Motor Coach No. _____	
TIRE OFF: Make _____	
Serial No. _____	
TIRE ON: Make _____	
Serial No. _____	
WHEEL: Front--Right ( ) Left ( )	
Rear Right--Inside ( ) Outside ( )	
Rear Left --Inside ( ) Outside ( )	
Spare ( )	
Speedometer Reading _____	
Operator _____	

Tire Change Report Made by Drivers

2:10 p.m. the following day when he returns to Pendleton, arriving at 11:50 p.m. The regular drivers' days off are arranged so that the relief driver replaces them on each run for one trip each week.

### UNION PACIFIC SYSTEM UNION PACIFIC STAGES, INCORPORATED CLEARANCE CARD

COACH NO. \_\_\_\_\_ DATE \_\_\_\_\_ 192\_\_

THIS COACH HAS BEEN  
INSPECTED AND IS IN  
1ST CLASS MECHANICAL  
CONDITION TO THE BEST  
OF MY KNOWLEDGE

MECHANIC \_\_\_\_\_

DRIVER WILL NOT LEAVE PENDLETON WITHOUT THIS CARD  
SIGNED BY MECHANIC AND IN HIS POSSESSION.

Clearance Card Carried in All Union Pacific Coaches

The drivers furnish their own uniforms and the company furnishes the caps and metal Union Pacific insignia worn by the drivers. The uniforms are cleaned each week on the drivers' days off, the company paying for this. The uniforms are made of grey whip cord. At the present time the company is putting its drivers through a two months' period in the shop where they work under the direction of the mechanic as helpers. In the future, new drivers will be taken on only after they complete the shop training.



Mack Motor Coach of the Type Operated by the Union Pacific





The coaches are given a thorough inspection every week on their idle day, so that there are no inspections based on mileage. Since the operation is still small, the superintendent is able to ride in each of the coaches every week in order to see that they are operating properly.

At Walla Walla, space in a public garage is rented for the storage of the motor coach over night. The coach used on this run is washed and greased at Pendleton. At Portland, however, space in a garage is contracted for, the contract providing not only for storage but also for washing and greasing.

An interesting indication of the work of the maintenance department is the clearance card which is posted

Form UNION PACIFIC STAGES INC.	
Motor Coach No. _____	
Receipt for Gasoline, Lubricating Oil, Grease etc., for Motor Coaches.	
_____ 192	
Received from _____	Filling Station
	Pump Reading
_____ Gals. Gasoline	
_____ Quarts Lubricating Oil	
_____ Pounds Grease	
_____ Driver or Mechanic	

Gasoline, Oil and Grease Receipt Made by Driver or Mechanic

in a conspicuous place in each coach before it starts out on its run in the morning. This clearance card, which bears the number of the coach and the date, reads as follows: "This coach has been inspected and is in first-class mechanical condition to the best of my knowledge." The card is signed by the mechanic and drivers are prohibited from leaving Pendleton without it.

#### Stations

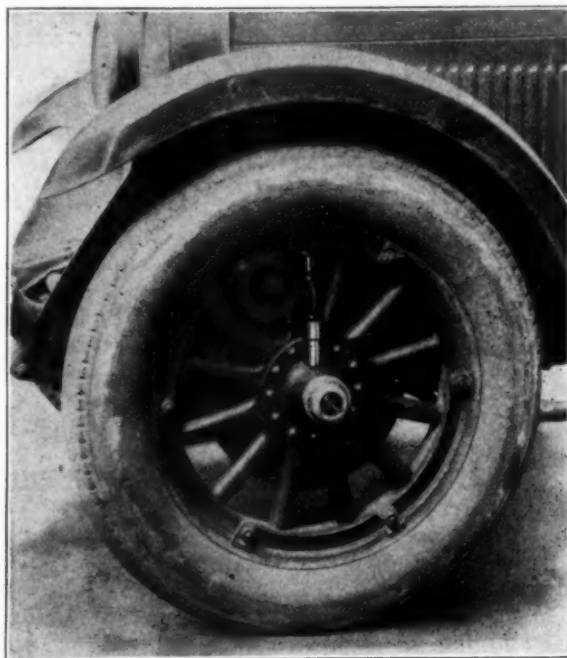
Although the towns served by the Union Pacific motor coaches are all located along the line of the railway, the coaches make regular stops at only a few of the railway stations. Stops are made at railroad stations at Hood River, The Dalles, Pendleton, and Walla Walla. At Portland, the Sixth street motor coach terminal is used by the Union Pacific coaches, as well as by the motor coaches of the Southern Pacific, the Spokane, Portland & Seattle, and several independent lines.

At other points the Union Pacific coaches stop at hotels, lunch rooms, and stores of various kinds. All of these stations, which are identified by large metal signs bearing the insignia of the Union Pacific Stages, sell tickets and handle package shipments on a commission basis. A traveling passenger agent is employed by the motor coach company, with headquarters at The Dalles, who keeps a check on the agents located along the line, as well as solicits business directly.

## An Automatic Inflator

**A**N automatic tire inflator designed to maintain a predetermined tire pressure has been placed on the market by the Yellow Jack-It Manufacturing Company, 225 North Green street, Chicago. The device, which requires no adjustments or oiling, is built on the principle of an air compressor.

A hardened cam is mounted on the wheel spindle underneath the hub plate. A roller, mounted on the end of a small piston, follows the cam. When the roller reaches the cam peak, the air compression stroke is completed. Thus, each revolution of the wheel forces air past the intake valve into the inner tube. A check valve



A Device for Automatically Maintaining a Predetermined Tire Pressure

is provided which is set for the air pressure specified for the tire. When the pressure is up to the required amount, the check valve functions and carries off the surplus air.

While the vehicle is in motion, the operator knows that the inflator is maintaining the proper tire pressure. Should the car stop and there be a loss of air owing to a slow leak or puncture, yet not sufficient to cause a flat tire, the automatic inflator begins to function as soon as the car starts, with the result that the proper pressure is built up in a short interval of time.

THE CENTRAL OF GEORGIA, which for several months has been operating a motor coach line in replacement of passenger train service between Perry, Ga., and Fort Valley, is reported to have under consideration the establishment of motor coach service between Atlanta, Ga., and Macon.



# Reading Begins Highway Operation

*First motor coach lines start April 29, culminating two and a half years of planning*

THE Reading Transportation Company, highway subsidiary of the Reading Company, will on April 29 begin the operation of motor coaches on the following routes in Eastern Pennsylvania:

	Route Miles	Annual Coach Miles
Jenkintown-Glenside-Willow Grove-Hatboro-Ivyland-New Hope .....	24.6	102,039
Lansdale-Chalfont-Doylestown .....	12.0	68,832
Langhorne-Newtown-Doylestown .....	19.3	56,152
Pottstown-Boyertown-Barto-Bally .....	13.3	30,729
Milton-West Milton .....	1.2	9,261
Total .....	70.4	267,013

In addition, the company plans to begin operation of three further routes about June 1. These are as follows:

	Route Miles	Annual Coach Miles
Carlisle-Gettysburg .....	29.0	39,324
Carlisle-Shippensburg .....	22.7	56,841
Pottsville-Frackville-Shenandoah .....	12.0	66,336
Pottsville-Tremont-Lykens .....	32.0	91,709
Total .....	95.7	254,210

Applications are pending before the Public Service Commission for authority to operate over the following additional routes:

	Route Miles
Jenkintown-Bethayres-Somerton-Feasterville .....	9.5
Glenside-Ambler-Pennlyn .....	7.0
Glenside-Chalfont .....	13.5

Adding the mileage of these routes authorized and pending gives a total of 196 miles for the Reading's

initial undertaking in the highway transportation field.

## Coaches Supplement, Rather

### Than Supplant, Train Service

The motor coaches will be closely co-ordinated with the train service, using trains for the heavy traffic and the motor coaches on lighter traffic routes. In no case have the motor coaches been used to supplant all train service. Rather it has been the plan to substitute the coaches for the less well patronized trains, but keeping a groundwork of train service on all lines served by motor coaches.

The purpose of the motor coach installation has been to maintain, and even improve, the frequency of service provided to the patrons of the railroad in places where the traffic does not warrant such frequency by the steam train. The substitution of motor coach service will therefore have the dual effect of improving the frequency of service to patrons and saving important sums in operating expenses to the railroad.

There will be the further advantage to the railroad on some lines of reduced interference by frequent passenger trains to the movement of freight traffic.

The coach designed by the Reading officers for this operation was described in the *Motor Transport Section* of March 24, page 713. Great care was exercised in building a vehicle adapted to railroad needs and, as was pointed out in the previous article, the original design had several months' test in actual road service before additional units were ordered.

## Choosing and Training Drivers

The same careful planning shown in selecting a properly designed coach has characterized the other arrangements made by the company preparatory to



beginning highway operation. Drivers have been carefully chosen and trained. Incidentally, the choice of high-grade men for drivers has been facilitated by an unusually large number of applicants for these positions, such a position with an old established transportation company apparently appealing strongly to men of experience in this field.

A complete code of operating rules has been compiled and issued to drivers, all of whom have been required to pass a written examination on these rules. A page from the form used in the examination is shown in an accompanying illustration. The examination is exhaustive, i.e., there is a question covering every rule in the book and the questions are numbered to correspond to the numbers of the rules in the rule book. The written examination papers will be kept in the files with the driver's personnel records, eliminating the plea in case of infraction that the driver did not understand the rule. In addition to the rules examination, there is also a rigid physical examination and drivers must, of course, show credentials from the state proving themselves to be licensed drivers. It is the belief of the officers of the company that much of the success of the highway operation will be based on the caliber of men which it has to represent it as drivers. Hence the care which it has exercised in their selection.

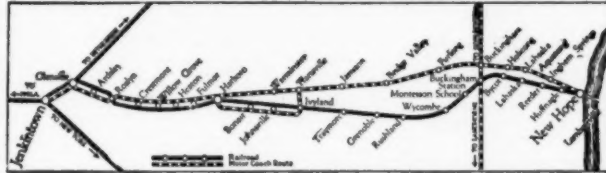
Uniforms for the drivers have been carefully selected. They are dark gray whipcord, of military cut, with brass buttons and cordovan puttees. The cap bears the Reading's diamond-shaped monogram and "Reading Transportation Company" is embroidered in gold on the coat.

#### Ticketing

The operations of the motor coach line will be separate from those of the railroad. Rates on the motor coaches will be based generally on the railroad basis of 3.6 cents a mile. In addition to one-way tickets and

round trip tickets, the motor coach line will offer for sale a twenty-trip family ticket at approximately one-third less than straight fare. Cash fares or tickets will

RAILROAD STATION	CORRESPONDING MOTORCOACH STOPS	
	Name	Location of scheduled stops and approximate distance from Railroad Station.
Jenkintown.....	Jenkintown.....	Reading Company Station..... Miles
Glenide.....	Glenide.....	Mt. Carmel and Roberts Avenue..... 0
Ardley.....	Ardley.....	Edge Hill and Jenkintown Roads..... 0
Roslyn.....	Roslyn.....	Reading Company Station..... 0
Crestmont.....	Crestmont.....	Easton Road and Welsh Road..... 0.1
Willow Grove.....	Willow Grove.....	Easton Road and York Road..... 0.1
Heaton.....	Heaton.....	York Road and Fitzwater Road..... 0.3
Fulmer.....	Fulmer.....	York Road and Warminster Road..... 0.3
Hatboro.....	Hatboro.....	(Shown in connection with motor coach lines)
Bonnair.....	Bonnair.....	Jacksonville Road and Station Road..... 0.3
Johnsville.....	Johnsville.....	Jacksonville Road and Station Road..... 0.3
Iryland.....	Iryland.....	Reading Company Station and Post Office..... 0
Warminster.....	Warminster.....	York Road and Street Road..... 0
Hartsville.....	Hartsville.....	Post Office..... 0
Grenoble.....	Jamison.....	Post Office..... 2.8
Rushland.....	Bridge Valley.....	Bennell's Store..... 3.9
Wycombe.....	Furlong.....	Post Office..... 3.6
Buckingham.....	Buckingham.....	Post Office..... 0.7
Byest.....	Holicong.....	Post Office..... 1.0
Lebanon.....	Lebanon.....	Lebanon Service Station (Garage)..... 1.1
Aquetong.....	Aquetong.....	Thompson's Store..... 0
Reeder.....	Ingham Springs.....	York Road and Deer Park Road..... 0.6
Huffington.....	Huffington.....	York Road and Station Road..... 0
New Hope.....	New Hope.....	Reading Company Station..... 0

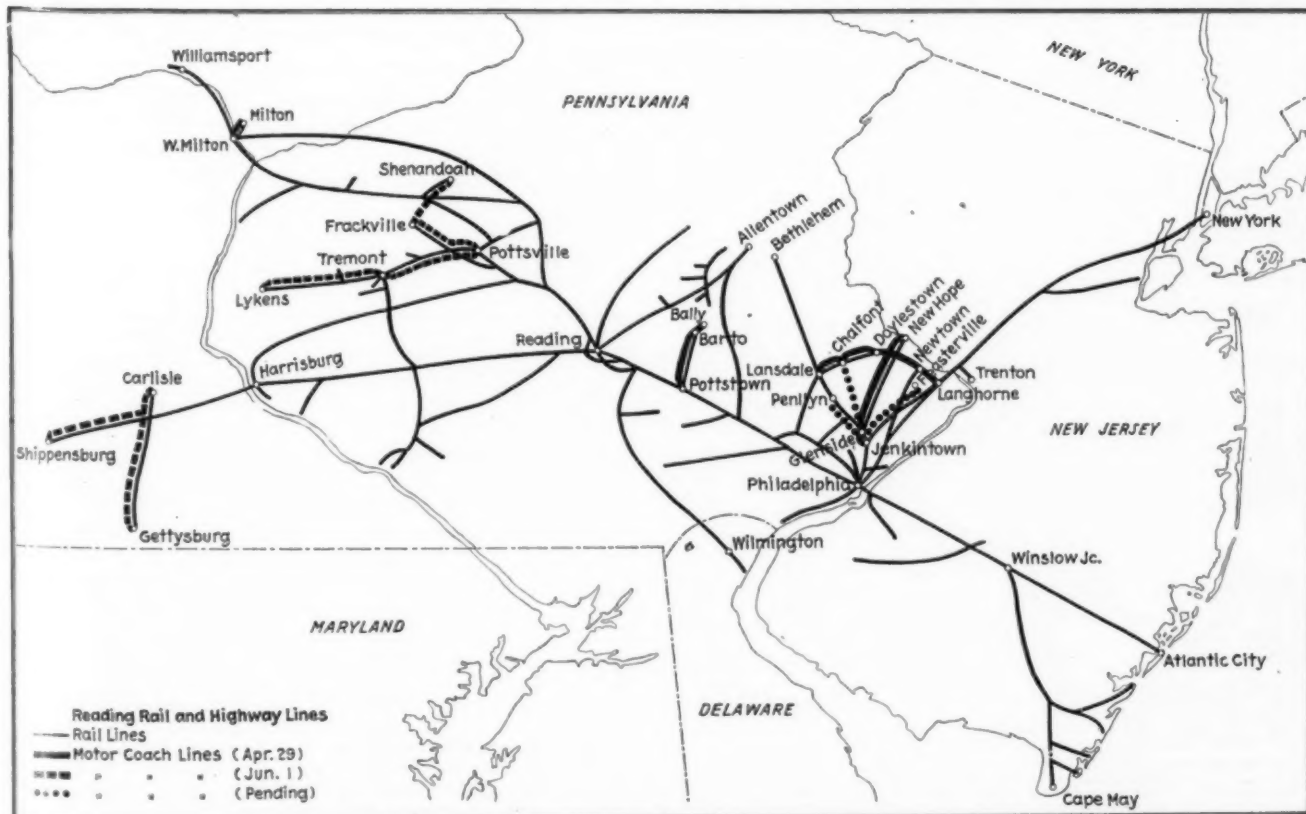


#### MOTORCOACH REGULATIONS

Regular one-way, round-trip and 10-trip railroad tickets will be good on motorcoaches between corresponding points.  
Railroad 46-, 50- and 60-trip Commutation Tickets, or fares restricted to designated trains, will not be good in motorcoaches.  
All forms of motorcoach tickets will be good in motorcoaches only and will not be accepted on trains.  
One-way motorcoach fares are the same as railroad fares between corresponding points.  
20-trip family motorcoach tickets will be issued between all motorcoach stops at an average reduction of about 30%. These tickets may be obtained from nearest railroad agent and will be good for three months for transportation of person named and those in immediate family.  
Passengers are urged to obtain tickets before boarding motorcoaches at stations where ticket offices are open.

Folder for Each Route Shows Map and Tells Location of All Stops

be collected from passengers when they enter the coaches, the driver issuing exit coupons of a form similar to the railroad cash fare duplex. Passengers will



Reading Company—Rail and Highway Lines

surrender these coupons upon leaving the coach and the driver will turn them in with his collections. One-

Willow Grove-Ivyland-New Hope

Effective April 29, 1928  
Subject to Change

# Reading System

Railway Lines Motor Coach Lines



## Time Tables

Between  
Philadelphia  
Willow Grove  
Hatboro  
Ivyland  
New Hope

**STANDARD TIME**  
All train and motor coach times shown herein are Eastern Standard Time. Add One Hour for "Daylight Saving" Time.

**EXCEPTION**  
Departure and arrival times of trains at Philadelphia (Reading Terminal) are shown in both Standard Time and Daylight Saving Time.

T. T. 23 (31-A) 4-23-28 10,900

# DAYLIGHT SAVING TIME

All times shown herein are Daylight Saving Time. Subtract one hour for Eastern Standard Time, or obtain regular time table reader.

Effective April 29, 1928  
Subject to Change

## Reading System

Railway  
Lines

Reading  
Lines

Motor Coach  
Lines

"Every Hour on the Hour"  
Philadelphia and New York

IVYLAND  
HATBORO  
WILLOW GROVE

CRESTMONT  
ROSLYN  
ARDSLEY

### WEEKDAYS

IVYLAND	HATBORO	WILLOW GROVE	LEAVE	Reading	Ardsley	Stop	PHILA.
5:53	5:40	5:47	5:50	5:54	5:57	CT	6:40
6:08	5:55	6:02	6:05	6:09	6:12	Y	7:00
6:23	6:10	6:17	6:20	6:24	6:27	CT	8:15
6:38	6:25	6:32	6:35	6:39	6:42	Y	8:45
6:53	6:40	6:47	6:50	6:54	6:57	CT	9:00
7:08	6:55	7:02	7:05	7:09	7:12	Y	10:30
7:23	7:10	7:17	7:20	7:24	7:27	CT	1:15
7:38	7:25	7:32	7:35	7:39	7:42	Y	1:45
7:53	7:40	7:47	7:50	7:54	7:57	CT	2:00
8:08	7:55	8:02	8:05	8:09	8:12	Y	2:45
8:23	8:10	8:17	8:20	8:24	8:27	CT	3:00
8:38	8:25	8:32	8:35	8:39	8:42	Y	4:00
8:53	8:40	8:47	8:50	8:54	8:57	CT	4:15
9:08	8:55	9:02	9:05	9:09	9:12	Y	5:00
9:23	9:10	9:17	9:20	9:24	9:27	CT	5:15
9:38	9:25	9:32	9:35	9:39	9:42	Y	6:00
9:53	9:40	9:47	9:50	9:54	9:57	CT	6:15
10:08	9:55	10:02	10:05	10:09	10:12	Y	7:00
10:23	10:10	10:17	10:20	10:24	10:27	CT	7:15

### SUNDAYS

IVYLAND	HATBORO	WILLOW GROVE	LEAVE	Reading	Ardsley	Stop	PHILA.
6:47	6:34	7:01	7:05	7:09	7:09	CT	7:40
1:08	1:01	1:07	1:11	1:15	1:15	Y	8:15
2:48	2:41	2:47	2:51	2:55	2:55	CT	9:00
4:48	4:41	4:47	4:51	4:55	4:55	Y	10:00
6:48	6:41	6:47	6:51	6:55	6:55	CT	11:00
8:48	8:41	8:47	8:51	8:55	8:55	Y	12:00
10:48	10:41	10:47	10:51	10:55	10:55	CT	1:00

AM Time to light type

PM Time to heavy type

\*Runs Saturdays only.

\*Train will not run Holidays, May 30, July 4 and Sept. 1.  
\*Construction not available to Philadelphia, on Holidays.

May 10, July 4 and Sept. 1.

CT=Stop at Reading Co. Station also York Rd. and  
Bibbory Rd.

D=Stop at Bibbory Rd. and York Rd.

F=Stop on signal or notice to conductor.

### NOTES

CT=Motor coach, change to train at Glenside.

Y=Motor coach, change to train at Jenkintown.

CT=Change trains at Glenside.

F=Through train.

DAYLIGHT SAVING TIME

DAYLIGHT SAVING TIME



# The Outlook for Regulation

*Commission follows recommendation of Flynn report  
except as to trucks—Hearings on Parker bill*

THE Interstate Commerce Commission on April 21 made public its report recommending a plan of federal regulation of interstate motor vehicle transportation of passengers by common carriers, following closely the recommendations made in the proposed report by Attorney-Examiner Leo J. Flynn on the commission's investigation of motor transportation, but omitting the recommendation for regulation of trucks at this time. The report is by Commissioner Esch, who presided at most of the hearings held in connection with the commission's protracted investigation, and is practically unanimous. Commissioner Woodlock concurred with reservations, favoring a policy of "hasten slowly" and Commissioner Brainerd did not participate in the case.

"There should be a definite coordination of all existing transportation agencies—land, water, and air," the Commission says. "The nation's transportation machine must be kept at its highest efficiency so as to advance the prosperity of the country and promote the happiness and welfare of its citizens in peace and in order that it may be prepared to respond as a tremendous factor in the national defense in time of war."

## Recommend Specific Authorization to Railways

The report recommends that railroads, whether steam or electric, and water carriers subject to the interstate commerce act, should be authorized to engage in interstate commerce by motor vehicles on the public highways. It also recommends that in connection with the granting of certificates for operation of motor vehicle lines reasonable consideration should be given, among other pertinent matters, to "available transportation service by any other existing transportation agency operating in the same territory" and to the effect upon it of the proposed service.

The conclusions reached by the commission are expressed in 26 numbered paragraphs, followed by some general observations. The text of these conclusions and of Commissioner Woodlock's opinion follows:

## Conclusions

1. Transportation of passengers and property by motor vehicles operating on the public highways is a well established and useful factor of the nation's transportation system.

2. Steam railroads and electric railways are engaging more and more extensively, either directly or through subsidiaries, in motor vehicle transportation as supplementary to their rail operations to replace or curtail train operations, or as feeders or distributing agencies.

3. Railroads, whether steam or electric, and water carriers, subject to the interstate commerce act, should be authorized to engage in interstate commerce by motor vehicles on the public highways, and thereafter such service should be subject to the provisions of the interstate commerce act, with the possible exception of section 15 (a), and legislation supplementary thereto. To the extent that a certificate of public convenience and necessity is an antecedent to the operation of other common carrier motor vehicles, steam and electric railroads and water carriers, subject to the interstate commerce act should be required to obtain a certificate of public convenience and necessity in like manner.

4. Railroads, whether steam or electric, and water carriers, subject to the interstate commerce act, and their motor carrier operations should be authorized, but not required by law at this time, to participate in joint rates and through routes with common carrier motor bus or motor truck lines hold-

ing certificates of convenience and necessity from some regulatory body, and such rate should be made subject to the provisions of the interstate commerce act.

5. The problem of regulating motor vehicle operations in interstate commerce is a comparatively new one, and it is too early to attempt regulation in too great detail.

6. Regulation of interstate commerce by motor vehicles operating as common carriers of passengers on the public highways over regular routes or between fixed termini should be provided for by law. The regulation of motor bus lines is more practicable and would present fewer difficulties than the regulation of common carrier motor truck lines.

7. While experience may show that the interstate transportation of property by motor vehicles operating as common carriers on the public highways should be regulated, there does not appear to be at this time public need therefor.

8. Original jurisdiction in the administration of regulation over motor bus lines operating in interstate or foreign commerce as common carriers over the public highways should be vested in such State regulatory bodies or officials as are, or may be, charged with the administration of laws and regulations covering intrastate commerce by motor bus lines in their respective States and who notify the Interstate Commerce Commission within a reasonable time that they will act. The Interstate Commerce Commission should be delegated to act with original jurisdiction instead of a State board whenever a State board fails to notify the Commission of its acceptance of the delegation of authority to act under the Federal Statute, and until such notice is received or where there is no State board. Joint boards composed of two or more State boards, or representatives of such States boards and of the Interstate Commerce Commission, when acting instead of a state board, should be authorized to act where the Commerce is carried on in two or more States.

9. The right of any party to appeal to the Interstate Commerce Commission from the action of a State board or a joint board should be provided.

10. Legislation for the regulation of motor bus lines operating as common carriers over the public highways should provide as prerequisites to operation.

(1) Certificate of convenience and necessity;

(2) Liability insurance or indemnity bond or satisfactory assurance of financial responsibility which will insure adequate protection for the responsibility assumed.

11. In conformity with our existing practices in determining whether or not public convenience and necessity require the granting of a certificate to operate, reasonable consideration, among other pertinent matters, should be given to available transportation service by any other existing transportation agency operating in the same territory, and to the effect which the proposed service may have upon any such existing transportation agency, the continued operation of which is important to the community served by it.

12. The law should provide that the fact that an applicant for a certificate of public convenience and necessity was in bona fide operation as a common carrier over the route or between the termini described in the application at least one year prior to the first day of the legislative session in which such law is enacted and since then, and at the time application is made has been continuously in operation should be considered prima facie evidence as to the public convenience and necessity of such operation.

13. Transfer of certificates of public convenience and necessity should be permitted with the approval of the issuing board. Revocation of a certificate should be authorized under circumstances of compelling public interest.

14. As a condition to the exercise of rights granted with a certificate of public convenience and necessity, the holder of the same should be required to undertake to furnish such additional service over the same route or to extend its line as the needs of the public may demand in the future.

15. The law should require that the interstate fares and charges of motor bus lines be just, reasonable, not unjustly discriminatory, and not unduly preferential or unduly prejudicial. Requirements should be made that tariffs be filed and posted. Provision should be made for the promulgation

of a uniform system of accounts to be used by motor bus lines in interstate commerce and for the filing of such reports as may be found necessary in the discretion of the Commission.

16. Provision should be made for the filing of complaints against fares, charges, practices or service of motor bus lines operating as common carriers in interstate commerce on the public highways. Such complaints should be filed with, and hearings thereon had before, the board or the Commission which granted the certificate of public convenience and necessity to the motor carrier against which complaint is made.

17. Common carrier motor bus lines should be authorized but at this time not required, to participate in joint rates and through routes with other common carrier motor bus lines or with steam railroads, electric railways, or water carriers, subject to the interstate commerce act, provided such motor carrier lines hold certificates of public convenience and necessity from some regulatory board.

18. Board discretionary power should be given to the regulatory boards in the matter of the classification of motor vehicle operations with respect to the administration of the provisions of the law. No exemptions should be permitted, however, from the provisions relating to certificates of public convenience and necessity, liability insurance or assurance of financial responsibility in case of accident or damage, or as to fares and charges.

19. Brokerage in transportation of passengers for hire in interstate commerce by motor vehicles operated by a person or company not holding a certificate of convenience and necessity from a regulatory body covering such service should be prohibited.

20. The issuance, interchange, or exchange of free passes and free transportation by common carrier motor carriers operating on the public highways in interstate commerce should be prohibited, except in substantially the same manner and to the same extent as provided for in the case of common carriers now subject to the interstate commerce act. The interchange or exchange of passes or free transportation between the officers or employees of motor carriers and common carriers subject to the interstate commerce act should not be authorized.

21. Federal legislation for the regulation of motor vehicles should include the transportation to or from a foreign country, but only so far as such transportation takes place within the United States.

22. The transportation of explosives and inflammables by motor vehicles in interstate or foreign commerce is prohibited by the Transportation of Explosives Act, except in the manner provided therein.

23. The provisions of the Bills of Lading Act are applicable to motor carriers operating in interstate or foreign commerce.

24. The provisions of the Clayton Antitrust Act relating to the business and transactions of common carriers are applicable to the business and transactions of motor carriers operating as common carriers in interstate or foreign commerce.

25. Public policy demands the fostering and preserving in full vigor of motor vehicle transportation as well as rail and water transportation. Section 500 of Transportation Act, 1920, should be amended to include motor vehicle transportation in the declaration of policy there made.

26. As far as practicable there should be a definite co-ordination of all existing transportation agencies—land, water, and air.

The general subject which has been considered in this report is one with which we have had little or no direct experience. The State commissions have had more such experience, and we have been favored with their cooperation and help in the preparation of the report; but even with them the public regulation of motor vehicles operating as common carriers is a comparatively new and experimental field of activity. Under the circumstances conclusions must of necessity be of a somewhat tentative character. As experience is gained in the future it may, and probably will, be necessary to revise and modify the conclusions set forth above, and this emphasizes the desirability of proceeding gradually and with due caution in the development of a system of interstate public regulation.

The situation may be illustrated by the conclusion numbered (3) above. Some of the members of the commission are in considerable doubt with respect to this particular conclusion. It is to the effect that steam or electric railroads and water carriers should be authorized to engage in interstate commerce by motor vehicles on the public highways, and thereafter that such service should be subject to all of the provisions of the interstate commerce act with the possible exception of section 15 (a). This conclusion applies to both motor bus and motor truck operation, but only when the carriers named engage

therein *directly*. It does not apply when they engage in these new forms of transportation *indirectly*, through the medium of subsidiary companies. In the latter event, therefore, there would be no public regulation of interstate motor truck operation, for none is recommended in the case of motor truck operation generally.

The members of the commission above mentioned entertain doubt as to the wisdom of this distinction between the direct operation of motor vehicles by rail and water carriers and their indirect operation through subsidiaries. They are inclined to the view that the operation of motor trucks as an adjunct to rail or water transportation under the auspices and with the financial backing of powerful rail or water carriers is quite a different thing from the operation of motor trucks by independent agencies and may well be brought under comprehensive public regulation even though no similar regulation is provided in the case of independent operation, and whether or not it is carried on directly or through the medium of subsidiary companies. They fear that unless this is done the door will be opened to various forms of favoritism and abuse which will relate back to and effect the conduct by these carriers of their rail and water transportation. This, however, is a matter which will be clarified by experience, and can be taken up for consideration again in the light of such experience. It serves merely to indicate, as above suggested, the somewhat tentative character of the conclusion reached.

COMMISSIONER BRAINERD was necessarily absent when this case was argued and the report adopted, and took no part in its disposition.

WOODLOCK, *Commissioner*, concurring:

I concur in this report with reservations.

Regulation is not in itself a good thing. The less regulation that is necessary, other things being equal, the better for the community. It is necessary in the case of public service utilities because of their semi-monopolistic nature. Transportation in general is not *per se* of such nature; transportation by railroad is. Transportation by motor bus and motor truck does not necessarily depend upon monopolistic or semi-monopolistic organization or performance. It is manifest that at the present time these services are much more largely of a competitive than of a monopolistic nature. For that reason the need for regulation—except in so far as concerns the public safety—is not wholly clear. This being so regulation should proceed with caution and only in response to demonstrated needs. The great complexity of modern life has already compelled the centering of enormous power in regulatory bodies such as this commission. I do not view with satisfaction extension of the province in which that power is exercised, save under clearly demonstrated necessity for such extension.

"Hasten slowly," it seems to me, is the only safe policy to be followed in matters such as those dealt with in this report. Let experience teach us.

### The New Parker Bill

Several weeks prior to the release of the Commissioner's report, Representative Parker introduced a new bill in Congress providing for the regulation of interstate highway motor coach transportation. This bill, known as H.R.12380 differs considerably from Mr. Parker's earlier bill. Its main provisions were described in the *Railway Age* of March 31, page 759. The bill represented a synthesis of the views of the steam railroads, the electric railways, the Bus Division of the American Automobile Association and the state public utility commissioners.

Hearings on the bill were held by the House Committee and Foreign Commerce from April 10 to April 18, inclusive, with the omission of only two days. The testimony brought out that there is a fairly general approval of the bill on the part of the railways, electric railways, and other operators of motor vehicle transportation lines, and the state public utilities commissioners, but that many of its provisions are opposed by the National Automobile Chamber of Commerce, representing the manufacturers of motor vehicles. Some opposition on the same grounds was also made on behalf of some of the independent operators, the ground of objection being that the bill includes provision for regulation of rates and also that its provisions involve an unduly complicated system of machinery for its administration, divided between the Interstate Commerce



Commission and the state commissions. Some doubt was expressed also as to the constitutionality of the provisions for delegating authority to state commissioners to act for the federal government.

Strong arguments were made in the testimony before the committee as to the need for some plan of regulation of interstate commerce, in spite of that fact that it thus far represents only a small part of the total motor vehicle traffic, because of the effect of its unregulated competition on the regularly established lines and the railways, which are under regulation and under a greater responsibility for giving adequate service throughout the year and regardless of weather conditions.

Many members of the committee seemed by their questions to be inclined at first to balk at the idea of authorizing a commission to decide who shall or shall not engage in the business, and, at least until they had heard further argument on the question, to be somewhat hesitant about putting into effect a plan of rate regulation, as they seemed to be inclined to feel that competition would do more to reduce rates than could be done by regulation. After the close of the hearing, however, it was understood that there would probably be a majority of the committee in favor of some form of regulation, although some doubt as to whether an agreement could be reached on the details of the bill relating to the machinery of administration in time to pass a bill at this session of Congress.

An executive meeting of the committee was held on April 20 at which a sub-committee was appointed to consider the bill and the various suggested amendments and report back to the full committee. The sub-committee consists of Representatives Cooper, Ohio (chairman); Hoch, of Kansas; Nelson, of Maine; Lea, of California; and Huddleston, of Alabama.

#### **Railways Want Right to Engage in Motor Transportation**

The steam railways were represented at the hearing by R. N. Van Doren, vice-president and general counsel of the Chicago & Northwestern, and chairman of the law committee of the Association of Railway executives, and Alfred P. Thom, Jr., general solicitor of the Association of Railway Executives, who expressed general approval of the bill although they explained that the railroads had made concessions in the conference which led to the drafting of the Parker bill.

An amendment to the bill to enable the railroads to own and operate motor coach lines and thus furnish a service that would make it possible for them to abandon branch-line passenger train operation, by relieving them from the operation of the trust laws in such cases was proposed by Mr. Van Doren. He said that the railways are "concerned that when the time comes when railroads must go into the bus business we may be on the same basis as anyone else."

Mr. Van Doren said that practically everyone agrees that motor transportation should be regulated but that the regulation should not take the form of strangulation, and that the railroads are not seeking to oppose the development of industry but that their competitors shall not go unregulated.

"The railroads claim no vested interest in transportation," he said. "When a form of transportation arises that the public wants and that can render the service better than the railways the public is entitled to it. But the railroads are not a mere adjunct to the commercial structure of the United States. They are a part of it and their interests should not be adversely affected by any legislation unless there be pressing reason therefor.

We claim no prior right to the highways. Some of us could not get into the highways, but some of us may be required in self-defense to go into the bus business or even into the truck business and so we do not believe there should be any provision of law to prevent us.

"We have large investments to protect and we want to cut down our loss in passenger business. We are experiencing a continual decrease in short-haul passenger business, particularly on branch lines, although there is some slight increase in the long-haul business, and we find competitive bus lines on either side of us. Most of the competition is from the private automobile but to a growing extent the public is taking to the bus and we cannot correspondingly reduce our expenses by cutting down our passenger service. We are still a convenience and so we have to operate our trains in the winter when expenses are high and take them off in the summer when they are low."

Mr. Van Doren proposed an amendment to the bill as follows:

Any common carrier which shall engage in the transportation of passengers by motor vehicle upon the public highways, or which shall own and control a motor carrier which operates such motor vehicles, or which shall purchase and own the whole or part of the capital stock of a corporation organized or engaged as a motor carrier in the transportation of passengers by motor vehicle upon the public highways in interstate commerce, and for the operation of which motor vehicles a certificate of convenience and necessity has been obtained as in this act provided, shall be, and it is hereby, relieved from the operation of the "anti-trust laws," as designated in Section 1 of the act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved October 15, 1924, and of all other restraints or prohibitions by any law of the United States, in so far as may be necessary to enable it to own, control and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons in interstate commerce.

#### **Existing Transportation Should Be Considered**

The proposed legislation should require that consideration be given by the commission granting such certificates to the effect which a proposed motor bus operation would have on existing transportation agencies, Mr. Thom told the committee on the last day of the hearing replying to some of the earlier witnesses.

Mr. Thom said that the railroads do not contend that "the mere existence of a competing rail line should be sufficient ground to justify the denial of the application to operate a highway line" but that "the effect of the proposed motor bus operation upon the ability of the rail carrier to furnish service essential to the public is a proper and just matter for the regulatory body to consider." In conclusion he stated that while the bill may not be perfect the railroads believe it is workable and that "it reflects the composite views of those directly affected as to what can be presently accomplished."

#### **Provisions of Bill Criticized by N. A. C. C.**

C. C. McChord, former member of the Interstate Commerce Commission, who appeared as counsel for the National Automobile Chamber of Commerce, told the committee that the special committee of the organization appointed to consider regulation felt that there was much that was constructive in the Parker bill but also that there was much that "may prove destructive", he said in part.

The committee for which I speak believes that there is much that is constructive in the bill now before you, but also that there is much that may prove destructive. This will be taken up in detail by counsel to follow me who will point out that the measure goes too far in the direction of complete control without knowledge of what the effect of that control may be, and that the bill as proposed involves constitutional questions of grave doubt.

A bill similar to the Parker bill has been introduced in the Senate as S. 3992, by Senator Watson, of Indiana, chairman of the Senate committee on interstate commerce, but no action with reference to it has yet been taken by that committee.

# Propose Uniform Motor Coach Code

*Committee of N. A. C. C. and S. A. E. discusses conflicting state regulations and counsels uniformity*

**G**EORGE H. SCRAGG of the Mack-International Motor Company, serving as chairman of a committee appointed at the behest of the National Automobile Chamber of Commerce and the Society of Automotive Engineers to recommend and report on proposed uniform specifications for highway motor coaches, has made public the report of this committee. The proposed code of specifications has been submitted to various individuals and organizations in the field, asking endorsement as a basis on which to approach the public authorities of the various states, with a view of securing uniform specifications throughout the country.

It is pointed out that at the present time legal specifications for motor coaches vary so widely from state to state that vehicles meeting all requirements in some states are illegal in others, resulting in many difficulties for designers of vehicles intended for interstate operation and adding to the cost of manufacture.

After a discussion of the conflicting specifications in existing state laws, the report proceeds to make its recommendations, discussing each proposed specification thoroughly. It then summarizes these specifications in the form of a uniform code. This recommended uniform code follows in full:

## THE UNIFORM MOTOR BUS SPECIFICATIONS CODE OF THE STATE OF.....

Be it known that the.....commission of the state of.....hereby establishes the following rules and regulations for the construction of motor buses to be operated under authority of this commission. These are established under authority delegated in the provisions of Chapter..... of the public acts of.....

### APPLICATION OF REGULATIONS

Regulations herein set forth shall apply indiscriminately to all types of motor buses, i.e., parlor cars, sedan type buses, city type buses and observation parlor cars, either single or double decked, unless otherwise specified.

### DEFINITION OF TERMS

A *Parlor Car* is a bus designed to carry seated passengers only and having a longitudinal center aisle.

A *Sedan Bus* is one designed to carry seated passengers only, having full width transverse passenger seats and more than two entrance doors.

A *City Type Bus* is one designed for mass transportation to carry both seated and standing passengers. City type buses used in interurban service with a seat for every passenger will be approved for service if they conform to regulations applied to parlor cars.

An *Observation Parlor Car* is a bus designed with part of the passengers' compartment deck constructed on the chassis frame and partially constructed over a mail or baggage compartment, or other space not used for passenger carrying purposes.

*Single Deck Buses* are those carrying all passengers either seated or standing on the same level.

*Double Decked Buses* are those designed with two passenger decks, one directly over the other. This does not include the type of construction used in the Observation Parlor Car.

*Normal Vision* is that which will distinguish clearly with the naked eye or with artificial means the 20-20th line at a distance of 20 feet. (Ocular Nomenclature.)

*Atmospheric Conditions* under which lighting tests are to be conducted are those which shall be substantially free of fog, rain, snow, mist, dust, or smoke. It shall be a condition termed "clear" in weather terminology.

**RULE 1.—Certificate of Approval for Operations.**—Every bus

before it is operated in any service under authority of this commission must be inspected by a duly authorized agent thereof. If such inspection discloses that the bus conforms to the specifications established by the commission as herein set forth, it will be certified for registration in accordance with statutes.

**RULE 2.—Maximum Length of Buses.**—Buses to be approved for operation must not exceed a maximum overall length of thirty-three (33) feet.

**RULE 3.—Maximum Width of Buses.**—Buses to be approved for operation must not exceed a maximum overall width of ninety-six (96) inches.

**RULE 4.—Maximum Height of Buses.**—Buses to be approved for operation must not exceed a maximum unloaded overall height of fourteen (14) feet, six (6) inches.

**RULE 5.—Minimum Headroom.**—Buses to be approved for operation must have a clearance between the floor and head lining, at the intersection of longitudinal and transverse center lines of the passenger decks, not less than the following minimum dimensions:

City type buses.....	76"	Double Deck Buses:	
Parlor Car Buses & Parlor		Upper Deck.....	60"
Observation car buses.....	60"	Lower Deck.....	76"
Sedan Type Buses.....	56"		

**RULE 6.—Maximum Overhang Beyond Rear Axle.**—Buses to be approved for operation must not have a body extending beyond the center line of the rear axle more than seven-twenty-fourths (7/24th) of the overall length of the vehicle.

**RULE 7.—Maximum Overhang of Body Beyond Rear End of Chassis Frame.**—Buses to be approved for operation must not have a body which extends more than ten (10) inches beyond the rear end of the chassis frame at the frame level.

**RULE 8.—Ventilation.**—Buses to be approved for operation shall be constructed or equipped to afford adequate ventilation.

**RULE 9.—Passenger Stop Signals.**—Buses to be approved for operation shall be equipped with a passenger stop signal which must be within reasonably convenient reach of each passenger.

**RULE 10.—Service Door Specifications.**—Bus doors used or intended for a regular entrance and exit of passenger shall have a minimum clear width of twenty-four (24) inches; if such doors are non-folding units swung from hinges on one side, the same shall in all cases open outward; if such doors are of double hinged folding type they may open either inward or outward at the option of the owner.

**RULE 11.—Emergency Doors.**—Buses to be approved for operation must be equipped with at least one emergency door which shall open outward and conform to the following specifications:

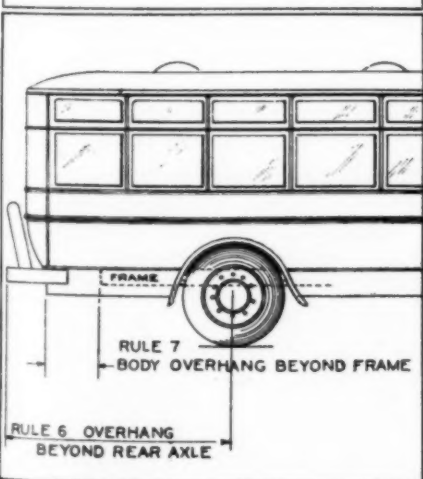
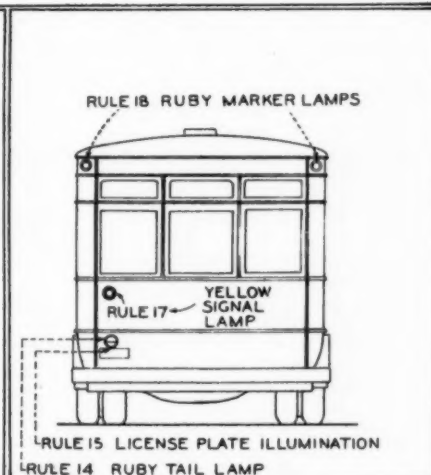
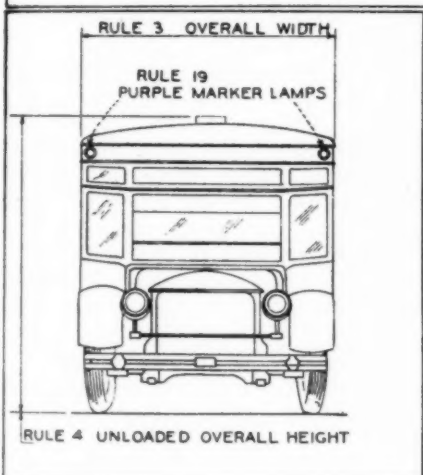
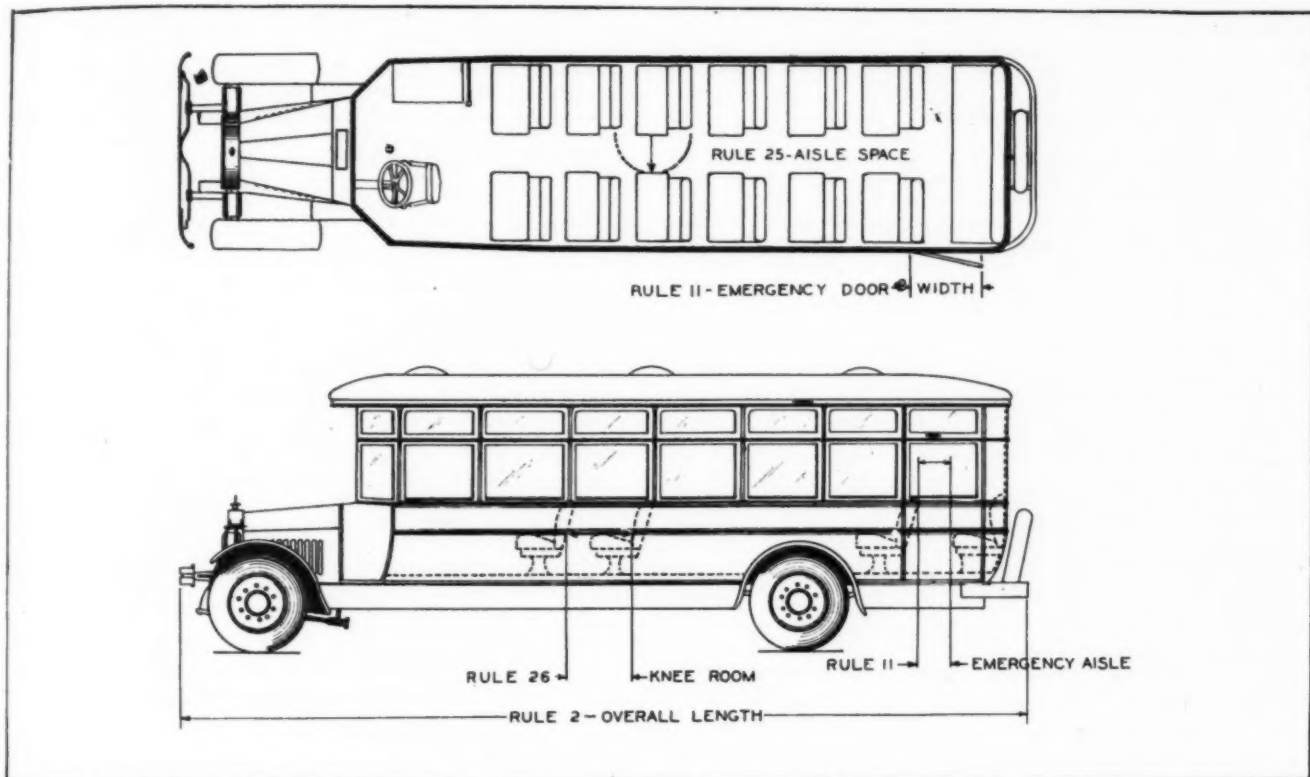
- It must be located in left side at the rear end of the bus body.
- It must have a minimum width of twenty-four (24) inches.
- It must have, leading to it, an unobstructed aisle at least 8 inches wide.
- It must be conspicuously marked "Emergency Door" with directions for opening.
- It must extend from the floor to the upper belt panel.
- It must be provided with a fastening device that may be quickly released in case of emergency, but which shall be protected against accidental release.

**RULE 12.—Hinge Guards.**—Buses must have the hinges and jams of all non-folding swinging doors opening outward, covered in a manner to prevent passengers' fingers or clothing being caught between door jams and pillars.

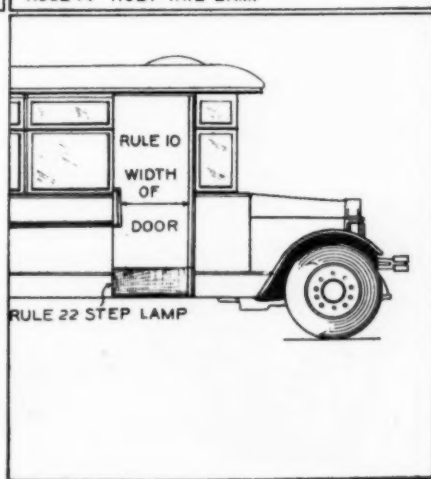
**RULE 13.—Destination Signs.**—Buses must be equipped with at least one destination sign which can be read day or night under atmospheric conditions, as defined, to one of normal vision at a distance of at least one hundred (100) feet.

**RULE 14.—Tail Lamps.**—Buses shall be equipped with a ruby tail lamp located in an unobstructed position in the lower left hand corner of the rear end of the bus body or firmly attached in the same position to body accessories. It shall be of sufficient size and candle power to be clearly visible under atmospheric conditions as defined to one of normal vision, for a distance at least five hundred (500) feet to the rear of the vehicle.





The Proposed Uniform Specifications



**RULE 15.—Registration Plate Illumination.**—Buses shall be equipped with a separate white lamp or the same as an integral part of the tail lamp located in the rear end of the bus body or firmly attached in the same position to body accessories which shall reflect upon the registration plate so that the same is legible under atmospheric conditions, as defined to one of normal vision at a distance of 50 feet.

**RULE 16.—Spot Lamps.**—Any bus may be equipped with, not to exceed, two spot lamps but they shall be so aimed and used upon approaching another vehicle that no part of the beam will be directed to the left of the center of the road nor more than 100 feet ahead of the bus.

**RULE 17.—Signal Lamps.**—Buses shall be equipped with at least one signal lamp, yellow in color, and connected so as to be automatically lighted when the speed of the vehicle is reduced by application of brakes or release of clutch. This lamp shall be located above the tail lamp but below the top of the middle belt panel or line. It shall be visible under atmospheric conditions as defined, to one of normal vision at a distance of 500 feet to the rear of the bus.

**RULE 18.—Rear Marker or Clearance Lamps.**—Buses shall be equipped with two front identification lamps, purple in color and located in the upper corners of the rear of the bus body to show as nearly as possible the extreme width of the vehicle yet keeping the lamps in the rear plane of the bus body. These lamps shall be visible under normal atmospheric conditions to one of normal vision at a distance of at least 300 feet.

**RULE 19.—Front Identification Lamps.**—Each bus shall be equipped with two front identification lamps, purple in color and located on opposite upper corners of the roof or body indicating the extreme width of the body. These lamps shall be visible when lighted under atmospheric conditions as defined to one of normal vision at a distance of at least 500 feet ahead of the vehicle.

**RULE 20.—Interior Illuminating Lamps.**—Buses shall be equipped with interior lamps sufficient to give an evenly distributed illumination of at least one rated candle power per square foot of passenger deck area. The deck area is to be determined by the maximum inside width of the deck and the maximum inside length thereof from the plane of the instrument board to the rear of the bus.

**RULE 21.—Dash Signal Lamps.**—Sedan buses shall be equipped with annunciator lamps on the dash which will be automatically lighted when doors are open. A lamp must be provided for each door on buses to which this rule is applicable.

**RULE 22.—Step Lamps.**—Buses, excepting sedan types, shall be equipped with a step lamp or lamps so placed that the step or steps at the service doors shall be clearly illuminated when the doors are open.

**RULE 23.—Operator's Guard Rail.**—City type buses shall be equipped with a guard rail constructed around the operator's seat in a manner to prevent standing passengers from obstructing the operator's vision over the clear range of vision through the windshield from the driver's seat. The guard rail must be constructed at least 2 inches above the highest point of the operator's seat back.

**RULE 24.—Space for Passengers.**—A minimum lineal dimen-

sion of 16" will be used to determine the seating capacity of seats in city type buses obviously designed to seat more than two passengers.

**RULE 25.—Aisle Space.**—City type buses must be so constructed that a radius 14" long from the center of the aisle end of any seat shall encounter no obstructing part of the seat or seats on the opposite side of the aisle. Parlor cars must be constructed to fulfill the requirements of this rule with 12" radii.

**RULE 26.—Knee Room.**—Buses to be approved for operation shall have a minimum clearance between the front of the back cushion and the nearest forward obstruction of 24" at the seat line.

**RULE 27.—Brakes.**—Buses to be approved for operation shall be equipped with brakes adequate to control the movement of and to stop and hold such vehicles, including two separate means of applying the brakes to at least two wheels and so constructed that no part which is liable to failure shall be common to the two. All such brakes shall be maintained in good working order.

**RULE 28.—Gasoline Tanks.**—Gasoline tanks shall be installed, filled, drained and vented outside of the body.

**RULE 29.—Bumpers.**—All buses shall be equipped with rear bumpers designed for heavy duty service. They shall be attached to the chassis frame, but shall extend at least 4" beyond the bus body at the frame level.

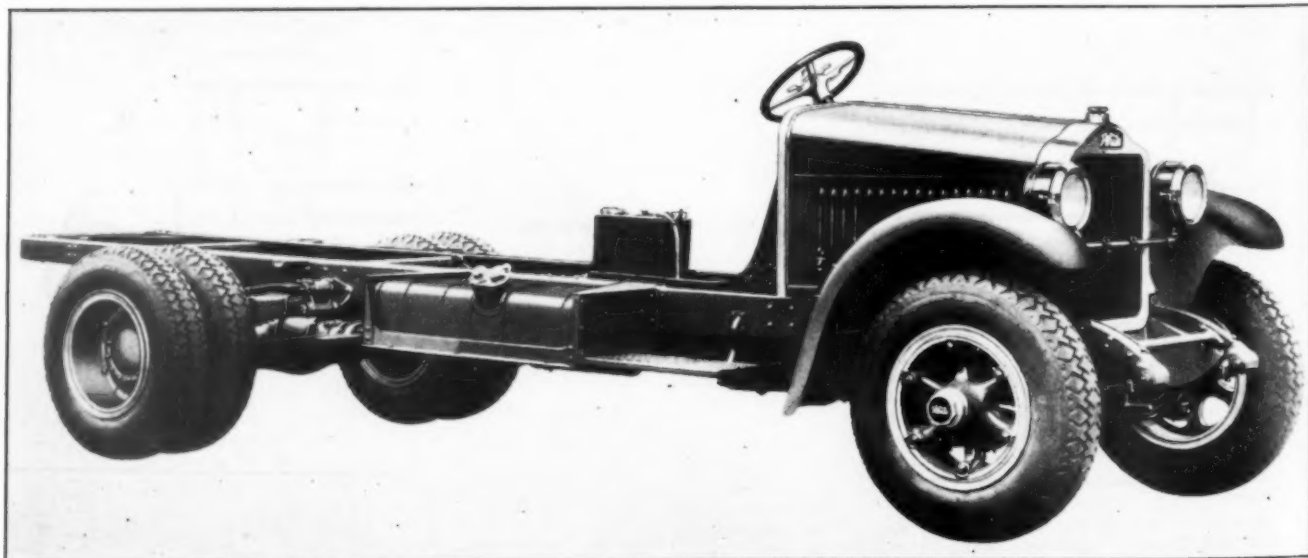
**RULE 30.—Exhaust Pipe.**—Exhaust pipes on all buses shall be extended to the rear end of the bus or to a point immediately in front of the left rear wheel or to the roof of the vehicle in chimney fashion.

**RULE 31.—Muffler.**—Buses to be approved for operation shall not be equipped with a cut-out; but they shall have a muffler by which exhaust noise may be reasonably quieted.

## White High-Speed Heavy Duty Motor Truck Chassis

A NEW high-speed heavy duty motor truck designed to meet conditions created by legal weight restrictions has just been announced by the White Company, Cleveland. It is known as the Model 58 and has a gross weight carrying capacity of 22,000 lb. In the design of this model special attention has been given to appearance with the result that a distinctive style has been added by the development of a stream line effect, augmented by a high narrow aluminum radiator, full crown fenders and other refinements.

The new model may be equipped with Westinghouse air brakes, electric starter and an auxiliary transmission. It is powered by the White G. R. B. four-cylinder



The White Model 58—a Three-Ton Chassis with 180-in. Wheel Base



engine having a bore of  $4\frac{1}{4}$  in. and a stroke of  $5\frac{3}{4}$  in. The cylinders are cast in one block and the cylinder head is removable. Aluminum pistons with Invar struts are used. Pressure feed lubrication to main, camshaft, connecting-rod and piston pin bearings is provided by means of a gear type oil pump and additional provision is made to insure a positive supply of clean oil under pressure. The cooling system is of the positive type with pump circulation. The carburetor is a compound jet rouble venturi type with air intake through a stove on the exhaust manifold and gasoline is supplied by a vacuum system from a 34-gal. tank on the right side of the chassis. The ignition system is the high tension magneto type. The transmission is of the four-speed selective sliding gear type having four speeds forward and one reverse. A full power take-off and a special countershaft takeoff can be furnished at extra cost. A high-speed reverse is recommended for use in connection with the auxiliary transmission which can be furnished for use in conjunction with the four-speed transmission providing a fifth speed with additional pulling power for meeting severa conditions.

The rear axle is the double reduction gear drive type, the first reduction being made by bevel gears in the center of the axle and the second reduction being obtained through spur gears in the rear wheels. The axle is of the full floating type with a one-piece heat-treated cast steel housing. The service brakes controlled by the foot pedal are of the externally contracting type, operating on a drum on the drive shaft, while the emergency brakes are internally expanding brakes on the rear wheels. Westinghouse air brakes may be supplied as optional, in which case the service brakes are metal shoes expanding against metal drums on the rear wheels and the emergency brakes operate on the drive shaft.

The wheels are of the cast steel spoke type, demountable, and the standard tire equipment consists of 36 in. by 5 in. solid tires single on the front wheels and dual on the rear. Pneumatic tire equipment is optional at extra cost. The rear axle has a minimum clearance of  $11\frac{1}{2}$  in. and the front axle a minimum clearance of 13 in. The standard chassis has a wheelbase of 180 in. with 162 in. and 195 in. optional at extra cost. With solid tires the gage is  $62\frac{1}{2}$  in. at the front wheels and  $63\frac{3}{4}$  in. at the rear. The overall width is 74 in. and the width of the frame is  $34\frac{1}{8}$  in.

## Motor Coach With Gas-Electric Drive

**A** 40-PASSENGER gas-electric coach recently developed by the Twin Coach Corporation, Kent, Ohio, resembles a trolley car in general appearance. Vestibules are provided at the front and rear

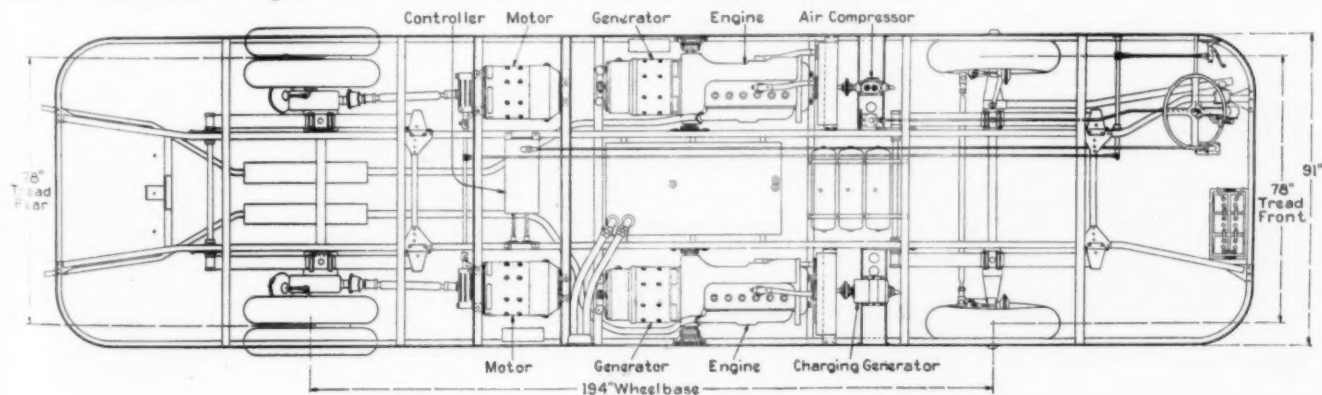
and the driving mechanism is mounted beneath the body instead of within the conventional hood.

The new coach weighs 17,200 lb. without passengers and with a full load of 40 persons weighing 150 lb. each, would have a total weight of more than 23,000 lb. Gas-electric drive, designed by the General Electric Company, Schenectady, N. Y., is used with two power plants located in the center, one on each side of the body, the longitudinal passenger seats covering each compartment.

Each power plant consists of a Waukesha, 50-hp., 1,800 r.p.m., gasoline engine driving a generator. The electricity generated is supplied to two motors which drive the coach, each being geared to a rear wheel axle through the conventional type propellor shaft and worm-drive axle. Each power plant is complete and independent of the other, with the exception of the gasoline throttles which are operated by one accelerator pedal.

Not only is the gasoline engine controlled by the accelerator pedal, but this pedal also controls the generation of electricity by an electric accelerator switch mechanically connected to the pedal. This switch controls the resistance in series with the generator shunt field and is so adjusted that the first depression of the accelerator pedal opens the gasoline throttle with full shunt field on the generator. If more power is desired, further depression of the pedal will insert resistance in series with the generator shunt field and allow the engines to speed up to their maximum power point. When maximum engine power is not required, the full field can again be applied to the generators by releasing the accelerator pedal. In this way, the gasoline engines are always run at wide open throttle position where fuel economy is best, and the power is varied as desired by varying engine speeds.

Applications for exhibiting space in connection with the American Electric Railway Association at Cleveland on September 22-28 were mailed to all members of the association on April 14. The applications must be returned within 30 days of that date. The exhibit committee will meet on May 16 to make the official allotment of space. The exhibits will occupy both floors of the Cleveland Auditorium as well as the entire annex. The two buildings are connected by a covered passageway in which there will be maintenance of way exhibits in action. Motor coaches and accessories, shop tools, garage equipment, and so forth, will be shown as well as many other kinds of equipment used in the transportation industry. Last year there were 293 exhibiting companies and a total of 8,024 delegates registered at the convention.



Plan Showing the Arrangement of the Power Plants in the Chassis



Three Views of the Exterior and Interior of the Baggage and Express Compartment.

## Central of Georgia Designs Combination Motor Coach and Truck

*Novel features of the unit permit complete substitution for passenger train service on branch line*

THE motor coach placed in operation by the Central of Georgia Motor Transport Company, subsidiary of the Central of Georgia Railway, between Fort Valley, Ga., and Perry, a distance of 12.5 miles, embodies a number of striking new features. It combines in one unit facilities for the transportation of mail, baggage and express, as well as passengers, enabling complete replacement of rail service by highway service on the route over which it operates. A brief description of the operation and of the motor coach was published in the Motor Transport Section of January 28, but the extraordinary features of the equipment justify a more detailed description of it.

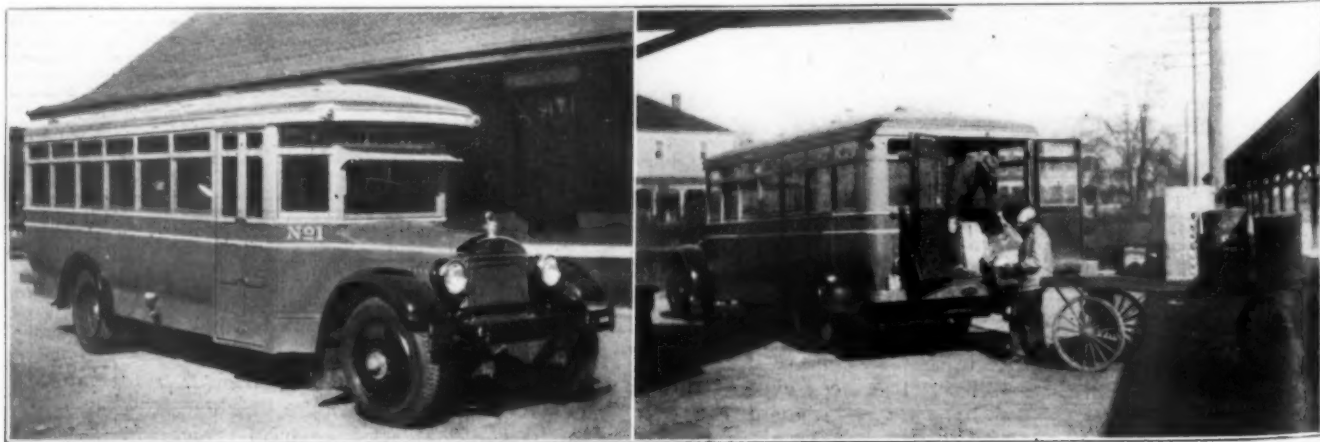
The motor coach is a four-cylinder, model AB city-type Mack unit which was built to the specifications of the Central of Georgia. The principal departure from standard motor coach design lies in the division of the body into two parts, the forward compartment being for passengers and the rear compartment for mail, baggage and express matter. Even the arrangement of seats in the passenger compartment, however, is unusual. The passenger compartment has seats for 15 pas-

sengers, the seats being of the undivided coach type. Back of the driver are four cross seats accommodating two passengers each. Immediately behind these are two folding seats of the taxi-type, each accommodating one passenger. When not needed for passengers these seats can be folded back to provide space for small hand baggage. To the rear of these folding seats is a cross seat accommodating five passengers.

Passengers enter the coach through a door at the front of the body on the right hand side. An emergency door is located on the left hand side of the coach, facing forward, this being approximately midway of the length of the body and opening into the section containing the taxi-type seats. A folding step opens automatically with the emergency door.

### Mail, Baggage and Express Compartment

The mail, baggage and express compartment is 60 in. long from front to rear and is separated from the passenger compartment by a solid wood and glass partition. Access to the baggage compartment is had through a four ft. by five ft. door, opening outward at



The Central of Georgia Mack Coach Loading at Fort Valley



the rear of the coach. This door is fastened by a self-battening wedge-bolt at the top and bottom which is controlled by a locking lever at the center. This door is padlocked for security.

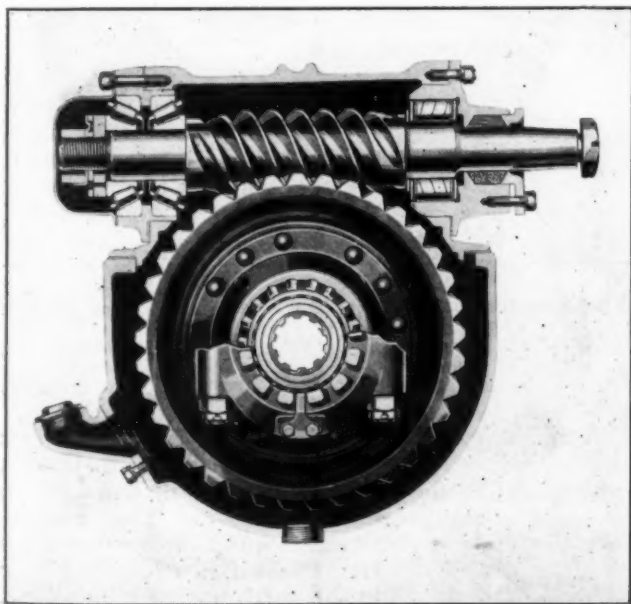
The coach was designed so that its floor is at a level with express truck platforms. The floor of the baggage compartment is covered with sheet steel, in which there are several holes for drainage to prevent damage to goods from leakage of other express matter handled.

The baggage compartment is provided with windows at the sides as well as in front and at the rear, the front and rear windows being fitted with wire glass. Further protection against wall and window damage is furnished by heavy wire mesh which covers the four inside wall areas of the baggage compartment. This mesh is secured to the walls by a number of small clamps.

The motor coach is a complete unit capable of carrying all of the traffic ordinarily carried on branch line passenger trains. On the basis of past experience, it is expected that about two-thirds of the load regularly carried by the coach will consist of mail, baggage and express, and that the passenger traffic will average between six and seven passengers per motor-coach mile.

## A New Timken Worm Drive Rear Axle

THE Timken-Detroit Axle Company, 400 Clark avenue, Detroit, Mich., has placed in production a new worm-drive rear axle which is of the full-floating type. The maximum weight permitted on the tires, at the ground, for this axle, which is designated as



Cross-Sectional View of the Worm Gear Driving Unit

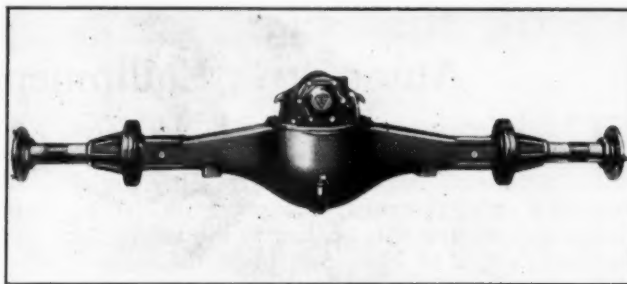
the 65,000 series, will be 10,500 lb. for either solid or pneumatic tire equipment.

Standard spring centers of 39 in. are maintained, and a tread of 65 in. permits the correct mounting of dual pneumatic tires with sufficient clearance, even if low pressure tires are used. Solid tire equipment can be used if desired.

The driving unit is supplied with a worm shaft either

overslung or underslung. The worm shaft is mounted in the Timken three-bearing mounting, and the differential is mounted by the Timken block type differential driving ring. The worm shaft end is a standard S.A.E.  $1\frac{1}{2}$  in. taper, and the small end of the taper is located  $10\frac{7}{8}$  in. forward of the axle center line. With the worm shaft overslung, the available gear ratios are  $5\frac{1}{2}$  to 1, 6 to 1,  $6\frac{3}{4}$  to 1;  $7\frac{1}{4}$  to 1,  $7\frac{3}{4}$  to 1,  $8\frac{3}{4}$  to 1 and  $9\frac{1}{4}$  to 1.

The axle housing is of the usual Timken square type with separate spring seats which can be supplied with or without bosses for the radius rods. The full-floating wheel bearing mounting is provided by a sleeve extending beyond the outer ends of the axle housing, and continuing in to the bowl section at the center of the hous-



The Timken 65,000 Series Axle, without Spring Seats, Brakes, Brake Drums, Wheel Bearings and Hubs, Weighs 444 lb.

ing. The housing sleeve is machined from heat-treated alloy-steel seamless tubing and is assembled with a heavy press fit in the housing. The inner ends of the full-floating axle shafts are ten-splined and  $1\frac{15}{16}$  in. in diameter. The straight portion of the shaft is  $1\frac{13}{16}$  in. in diameter. The shafts are supported at their inner ends by the differential side gears which, in turn, are supported by the differential cases mounted in Timken tapered roller bearings. At the outer ends the axle shafts are supported by integral driving flanges which are attached by studs to the flanges of the wheel hubs. Each wheel hub is mounted on Timken tapered roller bearings which are held in position and also adjusted by threaded nuts locked in position on the housing sleeve.

Recently, there has arisen an almost universal demand for 20-in. base dual pneumatic tires on the rear wheels of medium capacity motor trucks. The maximum diameter of brake drum that can be used with a 20-in. base tire is  $17\frac{1}{4}$  in. For the new 65,000 series axle, four types of brakes are available; all are  $17\frac{1}{4}$  in. in diameter and 4 in. in width.

Four types of brakes are available. The Timken duplex brake of the four shoe internal expanding type has two shoes acting on opposite quadrants of the brake drum which function as the service brake, and the other two shoes, also acting on opposite quadrants of the same brake drum, function as the emergency brake. Each of the four shoes is of equal braking area and, combined, they occupy the entire inside braking area of the brake drum. Both service and emergency brakes are actuated by adjustable cams. It is possible to hook up all four shoes as one brake.

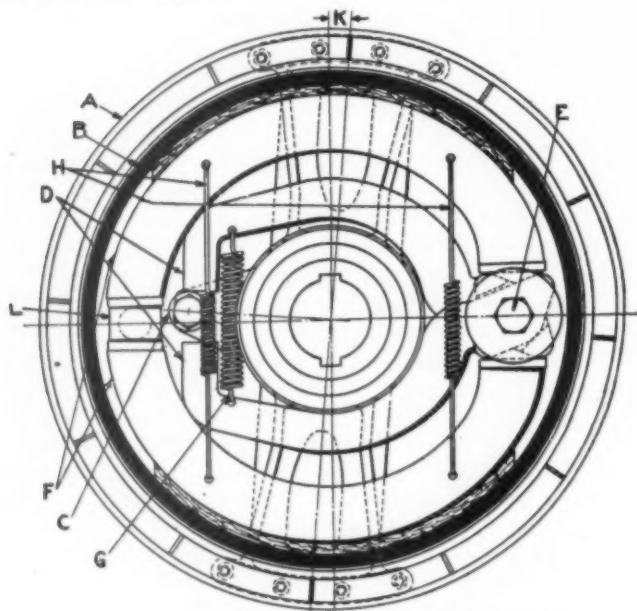
The Bendix brake of the three-shoe, internal, expanding type is actuated by a single cam. Two shoes provide a self-energizing brake in the forward direction. The Timken-Lockheed brake of the two-shoe, internal, expanding type is actuated by a direct acting hydraulic cylinder. The Timken-Westinghouse brake of the two-

shoe, internal, expanding type uses two spiral cams actuated by Westinghouse air chambers mounted directly on the axle housing.

If a separate braking system for emergency or parking is desired, the 65,000 series axle can be supplied with the Timken worm shaft brake. This is an internal expanding band brake, 13 in. in diameter by  $3\frac{1}{2}$  in. wide, acting against a brake drum mounted on the universal joint companion flange assembled on the forward end of the worm shaft. The worm shaft brake drum is machined from an alloy gray iron casting. The Timken worm shaft brake is assembled as a unit on the axle and is a distinctly separate braking system from the wheel brakes.

## Electric Brakes for Automotive Equipment

THE electric brakes designed by the Warner Electric Brake Corp., Beloit, Wis., for use on trailers, trucks and coaches are self-energizing and require a small current consumption. Referring to the drawing, the current is applied to the magnet *A* by the operator, either by hand control on the steering wheel or by foot control in connection with the usual service brake. Heavy waterproofed cables carry the electrical energy to magnets on the trailer. When the magnet *A* becomes energized, an annular projection of the drum *B*, which carries a floating armature in contact with the magnet face, causes the magnet to rotate through an angle *K*.



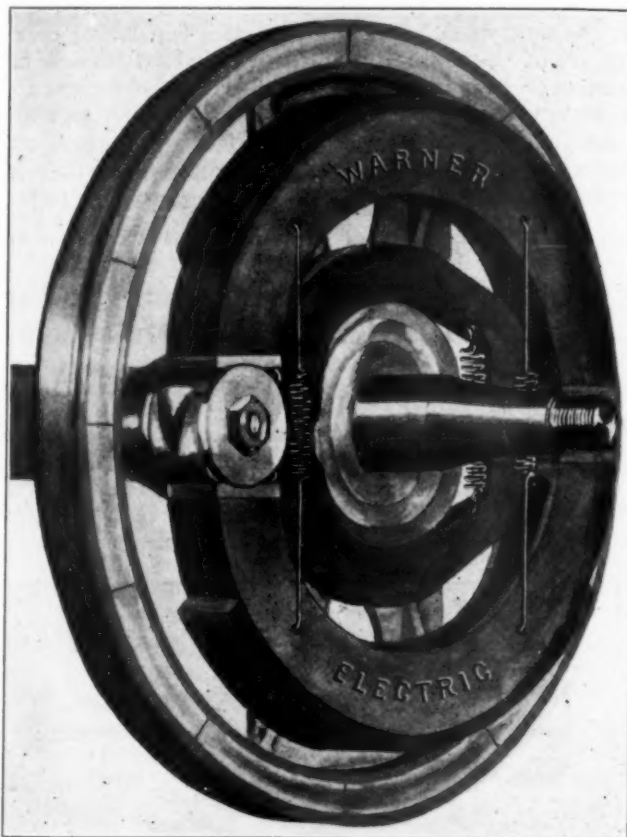
The Warner Electric Brake in the Set Position

Magnet *A* is carried on a spider which also carries the roller *C*. The movement of the magnet spider and roller, causes displacement of one or the other of the levers *D*, which are pivoted at *E*. This displacement causes expansion of the brake shoes *F*, through the cam action of the pivoted end of the lever, bringing the brake lining in contact with the surface of the brake drum *B*.

When the electrical circuit is broken and the holding power of magnet thus released, the springs *G* and *H* cause all the parts to return to their original position.

Lining wear is taken up automatically by the increase of the arc *K*, as the magnet is free to rotate further until the linings are worn out. Adjustment is necessary only when hand brakes are used for parking the unit. Cam *L* is used in this case, and it may require one or two adjustments during the life of the lining.

Electric current merely starts the braking action—The motion of the vehicle actually carries the magnets around and supplies the braking power. This makes the current consumption small—not over eight amperes on the heaviest vehicles, which is less than one headlight burns. All models of the brake are designed to do 100 per cent of the necessary braking, not depend-



The Assembled Brake with the Wheel and Drum Removed

ing on the truck for braking effort except in emergencies.

A rheostat operated either by the foot, in conjunction with the service brake, or by a lever on the steering wheel, enables the operator to apply the current, just as he chooses, to control the brakes. This insures a smooth, uniform deceleration and absolute control of the unit at all times regardless of speed or load. The method of multiplying the force makes it possible to develop a pressure of 34,000 lb. on each brake drum.

Every part of the brake is completely enclosed and protected so that no water, dirt or other matter can get in and affect its operation. No grease is used (because of self lubricating metal bushings) and provision is made for diverting any that might leak in from the bearings. This makes possible constant performance at all times. The brake shoes are lined with a specially manufactured type of molded brake lining that will insure approximately 75,000 miles without replacement.





One of the Large Fleet of Great Northern (Northland) Motor Coaches

## The Trend in Passenger Travel \*

*Since 1920 the number of passengers carried by the railways has decreased one-third—Motor coaches may be used to advantage*

By Ralph Budd

President, Great Northern

WE have become so accustomed to the ever increasing commercial and industrial activity in the United States that our appraisal of business conditions at the end of a year as "good", "fair", or "excellent" generally is based upon the relative increases in production compared with the increases in other years. It therefore comes as a distinct shock to hear of a substantial decrease, especially in an old established line of business. Such a decrease is that in the passenger traffic of the railways since 1920. In that year approximately 1,270,000,000 passengers were carried on the railways of the United States. In 1927, the number had declined to approximately 840,000,000, a decrease of approximately 33-1/3 per cent. During those seven years the population of the United States increased approximately 13 per cent.

As any business declines, it becomes necessary to reduce expenses. When freight traffic declines, fewer freight trains are run as a matter of course, but taking off passenger trains is not a simple matter, and so we find that with only two-thirds as many passengers in 1927 as in 1920, the railways made about 99 per cent as many passenger trainmiles. The loss of passenger traffic has been more severe on the western roads than in the East, the number of passengers handled in the western district being only about one-half as large in 1927 as in 1920. This doubtless is because commutation travel around the large eastern cities has been steadily increasing. To localize still further, in the state of Minnesota the railways in 1927 handled about one-third as many passengers as they did in 1920 and made about 92 per cent as many passenger train miles, while the population of Minnesota increased about 15 per cent in that period.

The eight per cent reduction in train miles probably

\* From an address before the Society of Automotive Engineers in New York on January 12.

has been offset by the heavier passenger cars now in use, so there probably has been little if any reduction in ton miles of passenger train service. It is therefore a fact entitled to very serious consideration that the falling off of railway passenger revenue means almost an equivalent reduction in net income, which must be made up out of freight and through passenger earnings. A reduction in passenger train miles would reduce the net loss.

### Traveling has Increased Greatly

There probably never has been a seven year period when the total amount of traveling done in the United States increased so much as it has since 1920, and this has been true in the West and Northwest as well as elsewhere. The loss in railway passenger business merely represents a change in mode of travel by the public. The railway continues to be supreme in long haul passenger traffic just as it is in freight traffic, and it is difficult for me to believe that the through passenger business of the railways will not continue to increase with the growing population and wealth in this country of great distances.

Except in and out of the largest cities, however, there is no doubt about frequent trips by small transportation units suiting the local traveler. The gas-electric rail motor car, which is being used quite extensively, is a step in response to that requirement. The highway motor coach is a further move in the same direction. The private automobile, of course, is the ultimate in local travel. There are about 20,600,000 automobiles in this country. Practically all of them are carrying passengers every day. In the aggregate, they are handling many times more people than the railways did during their busiest days of 1919 and 1920.

The private automobile is responsible for the railway passenger revenues being \$250,000,000 less in 1927

than in 1920. The convenience of highway travel is responsible for the motor coach, which in its best development affords flexibility as to route, schedules, and service as well as riding comforts comparable with the automobile, and at a cost comparable with railroad fare. Seeing these advantages, a great many small operators began a few years ago to run coaches, with the result that there was, and in many localities there still is, an excessive number of motor coaches on the highways, while the railways, on tracks parallel with the highways, are continuing to maintain approximately their former schedules. As the public ultimately pays for all such transportation, it clearly was and is in the public interest to eliminate the wasteful duplication. The ideal arrangement would seem to be the substitution of correlated motor coach and train schedules for the several competing coaches and trains.

#### An Example of Co-ordination

Summer travel from the middle and lower sections of the Mississippi valley to the hundreds of lake resorts of Minnesota illustrates how a motor coach system may serve as a connection for railway lines. Six railways bring passengers from the South to the Twin Cities whence coach lines radiate to all parts of Minnesota, reaching the lakes directly and with frequent service. A combination rail and coach haul thus offers the quickest, cheapest and most economical way for thousands of tourists to visit the lake park region of Minnesota, and by using the connecting coach lines and explaining the advantages to their patrons, the railways are able to win an important passenger movement that otherwise would go by private automobile.

In some cases; the best results may be obtained by having the railway operate the motor coaches as well as the trains. I consider effective regulation of the carriers of commerce on the highways as well as of those on the railways a prerequisite to such an arrangement. The various states now have pretty complete motor coach regulation within their borders, but the matter of federal regulation is a live issue. The majority of coach operators recognize the necessity for some federal legislation to provide for such regulation, but question the extent to which federal should supersede state authority.

#### Regulation Needed

Intrastate commerce comprises such a large part of the total commerce carried by motor coaches that their regulation should be left to the state authorities as far as possible. The problems for the most part will be local problems, even though companies may operate across as well as within state boundaries. The requirement of a certificate of convenience and necessity for interstate operation really seems to be the only pressing necessity for any federal legislation. The first question to determine is whether highway coaches are desirable. If they are, care should be taken in outlining regulation of them in order not to strangle the industry instead of protecting it, and the industry should be allowed to develop and become reasonably stable before too much is attempted in the way of detailed regulation.

Taxation is closely related to regulation, especially since regulation includes the fixing of rates and fares. There is no uniformity in the motor vehicle tax plan of the various states, but most states have adopted the idea that motor vehicle and gas taxes should go for highway construction and upkeep, if they do not indeed provide the entire fund. The tax on gasoline in this way has come to be almost universal. Those who choose to make

use of the public highway by riding in commercial vehicles may well insist that they are entitled to the best service and the lowest fares that the companies can give and that taxes beyond what would be fair and equitable, considering the use of the highways by these vehicles, place an unfair burden upon the riders, either by requiring a higher fare or by depriving them of a frequency or quality of service that otherwise would be available to them.

Taxation and regulation should be separate functions, the former based on the proportion the use of the coach bears to the total use of the highways and the latter covering rates, schedules, and safety of passengers, as well as such things as size, weight, and speed to insure proper use of the highways and protection of other vehicles using them.

There is no question but that the motor coach will become a more important factor in local passenger traffic and that the motor transport business will be a permanent and substantial institution if there is accorded to it a recognized, definite and stable public policy based on fair and reasonable regulation and taxation.

It seems to me that the public would get the most for its money if all regulation of all carriers of commerce would leave the managers of the transportation agencies as free as possible in their operation. Individual initiative is so desirable that it should be encouraged, especially during the development period. Restrictions which prevent a substantial amount of experimenting will delay and may preclude ultimate attainment.

Granting such treatment at the hands of regulatory bodies, the future of the motor coach industry in large measure will be what the operators make it. Among the marks to aim for, the most important are greater travel comfort for passengers and lower cost of operation.

#### Needed Improvements in Motor Coaches

Generally speaking, state regulations have limited overall lengths and widths of motor coaches, but comfort would be added by building bodies as wide as the law will permit and as high as practicable. There has been some improvement in seats, but they should be still wider and deeper. Heating is of great importance. A system is needed that will not use the exhaust gases for this purpose and at the same time will insure an ample supply of heat, evenly distributed throughout the car. The best riding coaches I have seen are of the long wheel base type, supporting a low hung chassis and having long narrow springs, balloon tires, and front air shock absorbers. There should be better insulation of bodies against heat and cold as well as against vehicle noises, and facilities for carrying baggage should be improved. The overall length having been limited by law, it is necessary to utilize the greatest possible proportion of length for passenger carrying capacity without sacrificing passenger comfort.

As to economy, reliability, speed, and riding qualities, it is only fair to say that there has been phenomenal improvement. I think these great improvements in the vehicles themselves are largely responsible for the growing popularity of motor coaches, as evidenced by the fact that there are now 90,000 of them in use in the United States. Most operators whom I know think that intercity coaches generally are underpowered and that great improvements may be expected from designers who will attempt to bring their motors up to the high state of development that has been reached in the airplane and passenger car field. More power with lower motor speeds will tend to increase the life of the motor,



insure smoothness of operation with less noise, and will reduce the cost of operation. It would be a great step forward if the weight of the chassis frames and bodies could be substantially reduced without sacrificing the necessary strength. Perhaps the use of aluminum alloys will make this feasible.

### Co-operation and Standardization

Co-operation between designers, manufacturers, and the operators is a very desirable thing, and while the different operators will have different ideas, based on their local conditions as well as their personal views, designers without doubt will get many good and practical suggestions which should be embodied in the ideal motor coach. There probably will not be any such thing as a definite standard, at least not in the near future, because the types will be constantly improving. At the same time it would seem as if a strong effort at standardization both in chassis and body design would eliminate some of the very frequent changes and the many different types of construction, and would result in economy from the standpoint of first cost, service and upkeep.

The trend is, and for several years has been, toward the highway for local travel, while long journeys continue to be made by rail. Railways may use motor coaches to advantage in combination with rail trips and so may hold some travel that otherwise would go entirely by automobile. Coaches may also be used to take the place of local train service which has become unprofitable, but which without some substitute would have to be continued. The ultimate extent of highway coach development depends, first, upon whether the public will consider the service important enough so that it will adopt towards the industry a fair, reasonable, and above all a definite and stable policy of regulation and taxation, and second, upon how far coach operators will go in providing the best equipment that can be devised in giving schedules and other services that meet every need of local travel, including reasonably low fares. The enterprise which coach operators have shown thus far and the willingness of manufacturers to co-operate with them in making improvements leaves little doubt as to the future.

## Co-ordinating Railway and Motor Coach Activities

A number of the railways operating motor coaches are finding it advantageous from the standpoint of reduced overhead and operating expenses to co-ordinate closely the activities of the railway company and the motor coach subsidiary. Such roads provide for more or less general joint ticketing arrangements and arrange for the handling of certain work which would otherwise have to be done by the motor coach subsidiary in the similar railway departments instead. Other companies separate the railway and motor coach activities to a greater extent. The practices in this respect of a number of railways operating motor coaches are described below. The information is given through the courtesy of the officers named, who responded to an inquiry sent to them by the *Railway Age*.

Regarding the handling of tickets and baggage, Geo. L. R. French, vice-president and general manager of the Rutland, says, "Motor coach fares are collected by the motor coach operator. Hence, no tickets are sold

for motor coach passage. As our motor coach service is in substitution of train service, all railroad tickets are honored for passage on the motor coach. Passengers are permitted to carry hand baggage with them on the coaches. Other baggage, such as trunks, is checked by the railroad agent and transported by train only when passengers are traveling on railroad tickets."

With respect to the co-ordination of the activities of the Rutland and its motor coach subsidiary, Mr. French says, "Matters pertaining to the operation, maintenance, purchasing, accounting, and so forth, of the motor coach subsidiary are taken care of by the respective heads of the departments having similar jurisdiction of railroad affairs. The motor coach subsidiary is only charged with the expenses of the supervising officers in connection with assignments pertaining solely to the subsidiary, such items of expense consisting principally of traveling expenses. No general supervision charge is made.

"For each calendar month, an income statement and general balance sheet, as of the close of the month, is rendered to the executive officers of the railroad, who are also the executive officers of the motor coach subsidiary. A report giving the analysis of operating costs is also rendered each month."

### Northland More Independent

The Northland Transportation Company, subsidiary of the Great Northern, follows a somewhat different procedure from that of the Rutland. "The Northland Transportation Company," says R. W. Budd, manager of operations, "does not use the Great Northern Railway Company's depots, nor is there an interchange of tickets. Generally speaking, the Northland Transportation Company is operated as independently as can be from its parent company, although, naturally, some matters, both of operation and accounting, are taken up with the railway at various times during the year."

The SamOset Company, subsidiary of the Maine Central, has no joint arrangement for the selling and honoring of tickets, nor for the handling of baggage, nor are any reports rendered to the railway by the subsidiary company, according to D. C. Douglass, vice-president and general manager. The accounting department of the railway, however, assumes responsibility for the accounting work of the motor coach company, a certain proportion of salaries being charged to the motor coach subsidiary as a result.

Describing the co-ordination of the activities of the Nashville, Chattanooga & St. Louis and its subsidiary, the N. C. & St. L. Motor Transit Company, F. W. Kelsey, superintendent of the Chattanooga division, says, "Our motor operation is handled the same as if it were a branch of the railway. Our motor coach line parallels our railroad line. The railroad agents take care of the tickets and baggage. In fact, tickets are sold on the same basis as if the subsidiary were a part of the railway, and baggage is handled in the same manner, as well as the express. We handle mail as we did on the trains, but under a different contract. The subsidiary company has the same official personnel as the railway company and, therefore, the accounting is done by the general accounting office of the railway. No charges are made against the motor transit company on account of general office expenses as this small operation did not add any additional cost to that of the railway Company's general forces. The only charges made against the motor transit company are the direct charges against operations. For the same reason that we make no

charges against the operation on account of general office expenses, we make no charges against the operation on account of ticket agents on the line. The chief aim of our motor coach installation was to reduce operating expenses by substituting the highway vehicles for rail service, and to reflect truly the result of this operation, we could only charge against the motor transit operation the actual out-of-pocket cost, the same as was charged against the former rail operation."

#### Southern Pacific Practices

The practices of the Southern Pacific Motor Transport Company, as described by T. B. Wilson, vice-president and manager, are as follows: "All forms of Southern Pacific tickets or tickets reading via Southern Pacific lines are honored on motor coaches of the Southern Pacific Motor Transport Company between its stations and scheduled stops. No baggage is checked via the Southern Pacific Motor Transport Company on any such railroad ticket, but the passenger may check his baggage at the railroad station in the regular way. Hand baggage may be carried on the coaches by the holder of any such railroad ticket. The motor transport company, whose stock is owned by the Southern Pacific Company, functions as a separate corporation with its own officers and employees. The motor transport company renders to the Southern Pacific a monthly operating statement of revenues and expenses."

L. B. Wickersham, general manager of the Norfolk Southern Bus Corporation, subsidiary of the Norfolk Southern, says, regarding the co-ordination of the activities of the two companies, "Tickets are sold at all of our railway ticket offices for transportation on our motor coach line. They are honored on either the railway or the motor coach line, as the fares are the same. Operating, mechanical, traffic and other departments have charge of the handling of the motor coach operation as well as the railway operation. Such portion of their time as is put in on the work of the subsidiary is charged to the motor coach line. The subsidiary company makes no reports to the railway company."

THE SOUTHERN PACIFIC which, together with the Atchison, Topeka & Santa Fe and Western Pacific, has been handling the interchange movement of l.c.l. freight in Oakland, Cal., entirely by tractor and trailer operation now plans to institute a similar replacement of rail movements for l.c.l. freight in San Francisco. The tractors and trailers will be operated under contract as in Oakland and bids are being taken from among the local haulage companies.

#### Hearing on Trucking in New York Set for May 16

The Interstate Commerce Commission has assigned its proceeding of investigation relating to freight handling by trucks in connection with constructive and off-track freight stations on Manhattan Island, New York, for hearing on May 16 before Examiner Harry C. Ames.

#### Uniform Motor Truck Freight

##### Classification in Utah

Uniform freight classifications for motor truck lines operating under certificates of convenience and necessity in the state of Utah have been ordered by the public utilities commission of that state. The new classifications adopted by the commission were prepared by the Traffic Service Bureau of Utah, agent for the individual carriers operating under the commission's certificates. All truck lines operating in the state were given until May 22, 1928, to revise and file their tariffs in accordance with the new classifications.

## Motor Transport News

#### Motor Coach Operations in Minnesota

Motor coaches operating in Minnesota in 1927 carried 12,351,612 passengers over a total distance of 18,283,126 miles, for which passenger fares of \$4,731,386 were paid, according to a special report issued by the Minnesota Railroad and Warehouse Commission. According to the report, the operating expenses of the motor coaches, together with taxes, amounted to \$4,527,508. The 29 companies operating in the state have 369 motor coaches with a total seating capacity of 9,262 persons and are authorized to operate over 6,218 miles of highway. The Northland Transportation Company did the largest business of any motor coach company in the state during 1927. The Northland had total revenues of \$2,012,000, carried 2,597,291 passengers, operated its motor coaches a total of 7,065,757 miles over routes 2,754 miles in length. Its operating expenses, not including taxes, were \$1,681,797.

#### Revoke Certificate of Interstate Operator

For violating the provisions of its certificate by doing an intrastate business, for accepting passengers traveling entirely within the state, and for exceeding the speed limit, the Ohio Utilities Commission has revoked the interstate certificate of the Detroit-Cincinnati Coach Lines, Inc., operating through Ohio between Detroit, Mich., and Covington, Ky. The revocation order was to go into effect 15 days after its issuance, but the commission anticipated that an injunction to prevent its enforcement would be asked by the coach company in the federal courts. The company is said not to recognize the right of the state commission to revoke a certificate for interstate operations. Members of the utilities commission contend, however, that inasmuch as the company was certified by the Ohio commission, the commission has the right to revoke the certificate.

#### Alton Re-applies for St. Louis-

##### Kansas City Certificate

The Alton Transportation Company, subsidiary of the Chicago & Alton, applied to the Missouri Public Service Commission on March 20 for a rehearing on its application for a certificate to permit the operation of motor coaches between St. Louis, Mo., and Kansas City, over federal highway No. 40. The commission rejected the original application on March 10 on the grounds that there is at the present time ample service between St. Louis and Kansas City over the railways and the two motor coach lines now holding certificates covering this route. The Alton's projected motor coach line between St. Louis and Kansas City was intended to be the backbone of its highway system in Missouri. It has applied for certificates covering feeder motor coach routes between Mexico, Mo., and Jefferson City; Mexico and Louisiana; Marshall and Highway No. 40; and Higginsville and Highway No. 40.

#### Consent to Restrictions Not

##### Necessary to Make Them Binding

The Pennsylvania Public Service Commission, A.16,970, has held that when it granted a certificate of convenience and necessity to a motor coach operator with the stipulation that if an established carrier extended a route into the territory such certificate should be void, formal consent of the grantee was not necessary to make the stipulation binding. Says the commission:

"The stipulation was inserted in the Neibauer certificate by the Commission in the light of all the facts bearing upon public necessity and convenience, and in the light of its experience with Neibauer's predecessor and with other operators under comparable circumstances and conditions. When the certificate was issued with the stipulation it was accepted by Neibauer and his operations were of course conducted under the restrictions specified in the certificate. Stipulations, conditions



and restrictions in certificates of public convenience are inserted by the Commission not by grace or consent of certificate holders, but for reasons which in the Commission's judgment make them necessary or advisable in the public interest."

### Highway Activities of British and Irish Railways

The railways of Great Britain and Ireland operate 292 passenger motor vehicles, 2,862 motor trucks and 32,229 horse drawn wagons and vans, according to a table published in the "Railways and Road Transport Section" of the Railway Gazette (London).

The railways have operated on the highways in freight service virtually since the beginning, since they make their own collection and delivery of freight. That a large part of this

### Highway Vehicles Operated by British and Irish Railways

	Passenger Motor Vehicles	Motor Freight and Parcels Vehicles	Horse-Drawn Freight and Parcels Vehicles
London Midland & Scottish....	3	1,592	18,870
London & North Eastern.....	40	322	7,516
Great Western .....	232	719	4,080
Southern .....	2	204	1,718
Metropolitan .....	4	23	45
Belfast & County Down <sup>1</sup> .....	3	( <sup>1</sup> )	( <sup>1</sup> )
Great Southern <sup>2</sup> .....	7	( <sup>1</sup> )	( <sup>1</sup> )
Northern Counties Committee <sup>2</sup> .....	1	( <sup>1</sup> )	( <sup>1</sup> )
Total .....	292	2,862	32,229

<sup>1</sup> Information not given.

<sup>2</sup> Irish Railways.

service is still unmotorized, however, is shown by the great preponderance of horse drawn wagons among the freight vehicles, motor trucks reaching a total of less than 10 per cent of that of the horse-drawn equipment.

The British railways are now seeking from Parliament authority to engage generally in road motor services and, in the event that they succeed in securing the passage of such legislation, railway participation in highway motor transport may be expected to increase considerably.

### Wisconsin Commission Announces

#### Motor Coach Rules

An initial set of rules and regulations governing the motor coach lines operating in Wisconsin has been announced by the railroad commission of that state. The motor coach operators are required to observe all automobile laws; to maintain regular service according to schedule and to carry proper insurance; to stay on their regular routes; to charge only the rates provided for in tariffs; to keep copies of tariffs, rates, fares, and time schedules open for public inspection; to display permits issued by the commission; to have drivers more than 21 years of age; to permit no smoking in the motor coaches; to permit no gasoline to be put into the tanks of motor coaches when passengers are on board; to provide toilet facilities for passengers; to have destination signs on the front end of the coaches; to provide for the lighting of the coaches at night; to provide for heating in winter; to equip the coaches with fire extinguishers; to provide for suitable ventilation; to equip intercity coaches with spare tires; to equip the coaches with speedometers in good working order; to keep the coaches clean, using an antiseptic solution in the interior; to report accidents involving fatalities immediately by telegraph and to submit written reports of other accidents; and to comply with all requests and instructions from state inspectors..

### One Motor Vehicle to Every 5.13 Persons

More than twenty-three million motor vehicles were registered in 1927, according to information collected from state registration authorities by the Bureau of Public Roads of the United States Department of Agriculture. The total of 23,127,315 was composed of 20,230,429 passenger vehicles and 2,896,886 motor trucks and road tractors. This registration represents an increase of 1,125,922 vehicles or 5 per cent more than in 1926. Using the population estimate for the middle of last year, there was one motor vehicle for every 5.13 persons.

States with a registration increase of 10 per cent or more are North Carolina, South Carolina, Utah and Arizona. States with a numerical increase of over 50,000 are New York, California, Ohio, Illinois, Texas and New Jersey.

As in other recent years, motor vehicle registration receipts constituted a substantial contribution to funds for road construction. The total receipts from registration fees and licenses amounted to \$301,061,132. These funds were allocated as follows: Collection and administration \$14,876,410; state highways \$189,985,289; local roads \$53,577,893; payments on state and county road bonds \$38,087,598; and for miscellaneous purposes \$4,533,942.

### Big Year in Road Building

Road construction in 1928 will at least equal and probably slightly exceed the highest mark recorded in any preceding year, according to reports received by the Bureau of Public Roads of the United States Department of Agriculture. Improvement of the state and federal-aid highway systems under the supervision of the highway departments of the several states will go forward during the season now opening with a construction of more than 20,000 miles of surfaced roads and about 8,000 miles graded and drained.

The state reports also indicate that at least 240,000 miles of the total of 288,000 in the state highway systems will be maintained this year under the supervision of the state highway departments.

Funds estimated as available for expenditure during the year by the state highway departments are about 25 per cent greater in total amount than similar estimates indicated at the beginning of last season. Although it is not possible, so early in the season, to anticipate closely the yield of gasoline and motor vehicle taxes and other sources of revenue it is said to be practically certain that the funds available to all state highway departments for construction and maintenance of roads and bridges will exceed \$750,000,000, and that local revenues, expendable by county and local authorities, will swell the highway total to upwards of \$1,300,000,000.

Details are not available concerning the work to be done by county and local authorities. It is anticipated that the year's work under state supervision will result in the construction of nearly 9,000 miles of hard-surfaced pavements, upwards of 12,000 miles of less expensive surfaced roads, and 8,000 miles of road adequately graded and drained.

### Orders for Equipment

THE BOSTON, REVERE BEACH & LYNN has placed an order for a 29-passenger A. C. F. de luxe urban coach.

THE BOSTON & MAINE has purchased five A. C. F. 29-passenger parlor observation coaches.

THE BOSTON & MAINE TRANSPORTATION COMPANY has ordered nine type-Y Yellow coaches of the parlor-type from the General Motors Truck Company, Pontiac, Mich.

THE NEW ENGLAND TRANSPORTATION COMPANY has ordered 14 type-Y Yellow coaches of the parlor-type from the General Motors Truck Company, Pontiac, Mich.

THE GRAND CANYON TRANSPORTATION COMPANY, operated by the Harvey Company for the Atchison, Topeka & Santa Fe, has ordered eight Model-53 parlor-type motor coaches from the White Company, Cleveland, Ohio.

THE NEW ENGLAND TRANSPORTATION COMPANY, highway subsidiary of the New York, New Haven & Hartford, has taken delivery on 6 Mack 4-cylinder motor coach chassis fitted with Brown bodies. This brings the number of Macks in the N. E. T.'s fleet to a total of 49.

### Among the Manufacturers

J. H. Williams & Co., Buffalo, N. Y. and the Husky Wrench Company, Milwaukee, Wis., have joined in a working agreement, for selling purposes only, whereby they can offer to the trade a complete line of combination wrench sets composed of the Williams and Husky wrenches.

Manufacturing, sales and service activities of the **Yellow Truck & Coach Manufacturing Company** and subsidiaries were transferred, on March 26, to the new plant at Pontiac, Mich. Henceforth all manufacturing activities will be carried on by the subsidiary, **General Motors Truck Corporation**. Sales and service will be handled by the **General Motors Truck Company**. The two latter companies should be addressed hereafter rather than the Yellow Company.

**Jay Rathbun**, vice-president in charge of the export department of the **White Company**, Cleveland, Ohio, has been appointed vice-president in charge of the Eastern region, with headquarters at New York. Mr. Rathbun was born at Battle Creek, Mich., in 1883, and attended the University of Michigan. He became associated with the White Company in 1911 as manager of sales for the State of New York, and in 1914 was appointed manager of export sales, with headquarters at New York. He was promoted to vice-president in charge of the export department in 1926.

**James D. Tew**, first vice-president of the **B. F. Goodrich Rubber Company**, was elected president at a recent meeting of the board of directors in New York. He succeeds **Harry**

**Hough**, who has resigned. Prior to his election as president of the company last September, Mr. Hough was controller for a period of 10 years. Before that time he had been a member of a firm of public accountants. Mr. Tew was born in Jamestown, N. Y., on May 2, 1882, and graduated from Harvard University in 1905. He entered the factory of the B. F. Goodrich Company at Akron, Ohio, in 1906, and 12 years later was appointed superintendent of the tire division. He was promoted to assistant works manager in 1925 and a year later was advanced to the position of works manager. Mr. Tew was elected first vice-president in September, 1927, being made also general sales manager a few months later.

The Dominion of Canada has granted a charter to **Canadian Ohmer, Ltd.**, which will acquire the business of Canadian Taximeters, Ltd., and will market in Canada all products manufactured by the Ohmer Fare Register Company, Dayton, Ohio. The headquarters of the new company have been established at Montreal, Que., and branch offices will later be located in Toronto, Ont., and Winnipeg, Man. The following officers of Canadian Ohmer, Ltd., have been chosen: **W. P. Kearney**, Montreal, president; **H. B. Ohmer**, Dayton, Ohio, vice-president and treasurer; **M. W. Drayton**, Montreal, second vice-president and secretary; **R. M. Ohmer**, assistant treasurer. **A. J. Hopkins** has been appointed general manager of the company.

**Martin A. O'Mara**, formerly vice-president in charge of sales of the White Company, Cleveland, Ohio, has been elected president of the **Brockway Motor Truck Corporation**, with headquarters at New York, succeeding **George A. Brockway**, who has been elected chairman of the board of directors. **J. W. Stephenson**, formerly president of the **Indiana Truck Corporation**, which has been merged with the Brockway company, has been elected vice-president and chairman of the executive committee of the latter company.

## New Publications

**THE INTERNATIONAL HARVESTER COMPANY**, Chicago, has issued a catalogue of its automotive equipment for railways, including motor trucks and industrial tractors.

## Motor Transport Officers

**E. D. Osterhout**, passenger traffic manager of the Reading, has been appointed also manager of the Reading Transportation Company, the railroad's highway subsidiary. **A. C. Tosh**, who has been serving the railway as superintendent of highway transportation during the period of planning, has been appointed superintendent of the transportation company. **D. W. Fisher**, heretofore assistant mechanical engineer of the railway, has been appointed assistant superintendent of the highway company. Mr. Osterhout was born in Philadelphia on October 13, 1886, and began his



E. D. Osterhout



A. C. Tosh



D. W. Fisher

railroad career with the Pennsylvania at its North Philadelphia station in 1903. Shortly thereafter he entered the service of the Reading as a clerk in the general passenger department. In 1910 he was appointed chief rate clerk in that department and in 1917 was advanced to the position of special representative. Shortly thereafter he became assistant general passenger agent becoming general passenger agent in 1922. Three years later he was appointed passenger traffic manager. He will continue to serve in that capacity in addition to his new duties. Mr. Tosh was born at Oneida, Pa., on July 10, 1891, and entered the service of the Reading as night clerk and operator at Catasauqua, Pa., in 1909. Later he served as an extra agent and as operator in the dispatcher's office at Reading, Pa., being appointed agent and dispatcher in 1916. He was later appointed an inspector attached to the staff of the general manager, becoming inspector of transportation in 1918. In 1925 when the Reading first began laying its plans for highway operation, Mr. Tosh was appointed chairman of the motor coach committee. He was appointed superintendent of highway transportation of the railway in 1926. Mr. Fisher was born at Manheim, Pa., on November 29, 1893, and was graduated from Stevens Technical School at Lancaster, Pa., in 1910. After several years service as a tool maker for the Hamilton Watch Company, he served for two years as an automotive mechanic in the same city. In 1916 he entered the service of the Reading as a machinist in the locomotive shops at Reading, Pa., being transferred to the office of mechanical engineer as a draftsman shortly thereafter. In 1919 he was appointed motive power inspector, being advanced to the position of assistant mechanical engineer in 1922.